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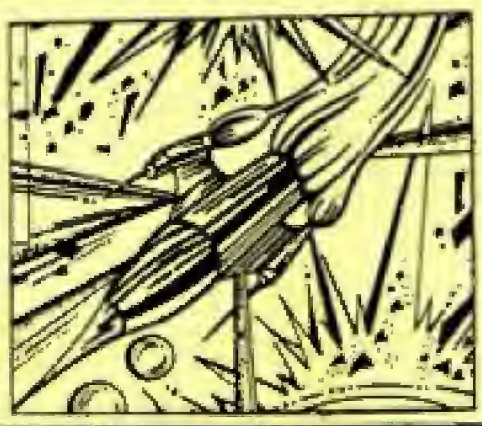

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Features Editor
Pete Bibby
Production Editor
Peter Glover
Art Editor
Heather Sheldrick
Advertisement Manager
John Riding
Advertising Sales
John Snowden
Editor in Chief, Database Publications
Peter Bramald

Published by Database Publications Ltd
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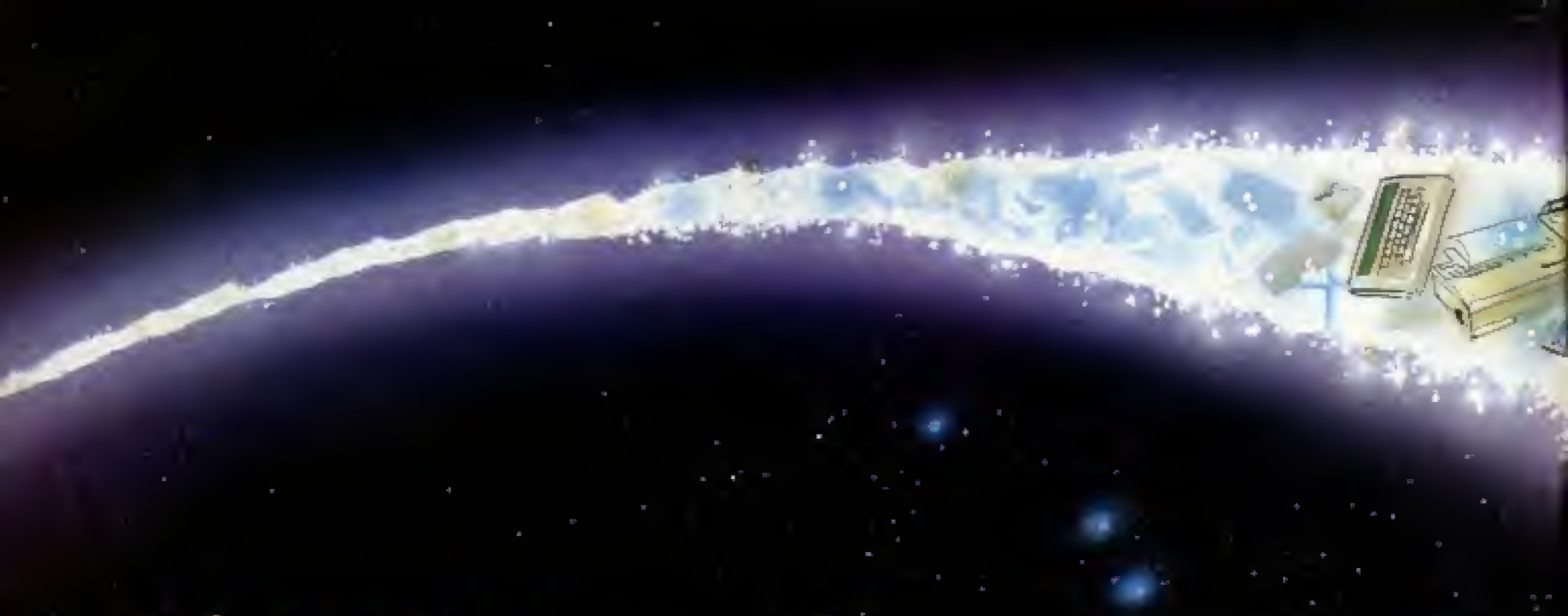

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electron user NEWS

Christmas comes early for Electron owners

CHRISTMAS has arrived early for Electron owners, with the wrappings coming off lots of exciting new hardware and software.

It will all be displayed at the Electron & BBC Micro User Show, New Horticultural Hall, Westminster, from November 14 to 17.

One of the main attractions is bound to be the Tube from Advanced Computer Products – an interface which connects the Electron to the Acorn second processor, giving an extra 64k of memory.

The device plugs into the Plus 1 and "gives a dramatic increase in speed of operation", according to ACP's John Huddlestone, who is also hoping to demonstrate, and possibly launch, a 1MHz bus for the Electron at the show.

All Plus 3 owners will want the new tape-to-disc ROM, T2P3, which Slogger is unveiling.

It will enable them to transfer most games from tape on to the Plus 3 disc system, greatly reducing the time taken to load and run a new game using T2P3 due to the much faster transfer rate.

The memory used by the ADFS does not affect the operation of T2P3 and even very large games may be transferred.

This has been achieved by programming the T2P3 with ADFS operations but using the minimum of Electron memory.

Slogger says a large number of games may be transferred to a single disc, and once there may be loaded and run by selecting the appropriate game from the menu. Price: £19.95.

From the same company comes Stargraph, a service ROM designed to fit into any ROM expansion socket to provide some useful extensions to the many graphics commands already available on the Electron.

It is compatible with the Plus 1 and Plus 3 interfaces and may be used with either or both. Price: £21.95.

Micro Aid is demonstrating the LTR1, a hard character, letter quality printer imported from Japan and priced at £110, and is launching its Pay Roll software for the Electron at £29.95.

The show sees an unusual event – the launch of a company, Shards Software, that will be offering adventure game Woodbury End for £9.95 and arcade game Whoopsy for £6.95.

Kansas City Systems is launching two new games at the show. Adventure of Zore, a scrolling adventure costing £8.50, is the last in the trilogy which includes Dracula Island and Ring of Time.

Moon Buggy, from the same firm, is a seven level arcade game at £8.50.

Comms pack is here

THE long-awaited communications package for the Electron has finally arrived.

Developed jointly by Acorn and Pace Micro Technology of Bradford, it will enable Electron users for the first time to reap the benefits of the telecommunications revolution.

The software for the package – known as Tellstar – has been written by Andy Hood, author of the acclaimed Commstar for the BBC Micro.

With its combination of viewdata and Ascii terminal capabilities contained in one eprom, Tellstar is housed on board an interface card designed to fit into a Plus One.

It is being offered with the bestselling Nightingale modem, also from Pace.

Thriving in Hong Kong

ELECTRON owners living in Hong Kong can now join their own Acorn Computer Users' Society.

The group already has more than 50 members and a monthly journal whose editor, Peter Dolwin, wrote to say that *Electron User's* monthly appearance on newsstands in the Crown Colony is always an eagerly awaited event.

Members meet every month at the premises of Acorn distributor Brainchild Computers in a building known locally as the Amah's Tooth because of its gold tinted windows.

The range of interests represented include education, music, business, games and programming.

Guest speakers, including leading figures in the computer industry passing through Hong Kong, are invited to address the monthly meetings.

Recently Roger Broadie, former deputy director of the Microelectronics in Education Project spoke to the group.

The society receives full support from Acorn, and Brainchild, and is able to offer its members a 25 per cent reduction in the cost of equipment necessary for them to connect to Hong Kong Telephone's Micronet service.

Tim programs himself into a job

Tim Davis . . . "It's fantastic"

TIM Davis has made certain he won't be joining the ranks of the unemployed when he leaves school – by winning a job.

Tim, 17, of Formby has to thank his Electron for ensuring that he was successful in the North West competition sponsored by the *Electron User*.

Now he'll be joining Database Software, a division of Database Publications, as a trainee programmer once he has completed his A levels.

The teenager, who already has nine O levels to his name, was one of 350 unemployed youngsters from the North West who entered the contest.

All they had to do was send in any program they had written either for the Electron or the BBC Micro.

Tim's entry was a disassembler in machine code, including Ascii dump, labels and other utilities for the Electron.

This took him into the grand final which was held during the opening day of the Electron & BBC Micro User Show in Manchester.

He negotiated the last hurdle by beating off the competition from the two other finalists in a test situation followed by an interview in front of a panel of judges.

"It was all a bit nerve racking", he told *Electron User*, "but it was worth it to win a job.

"What more could any one want, particularly when you live in an unemployment black spot like Merseyside".

After discussions with Database, Tim decided to return to school to take his A levels before starting work.

"It's fantastic", he said, "they are even going to keep the position open for me while I finish my schooling".

Judges for the final included star North West disc jockey Mike Sweeney of Piccadilly Radio, Richard Hemingway of Radio Manchester, Peter Davidson, head of Database Software, and Derek Meakin, joint managing director of Database Publications.

"The standard of entries for the competition were very high", said Derek Meakin, "but Tim's was nothing less than brilliant.

"He has a great future ahead of him with our company".

Facts on file

SOFTWARE house Kosmos has launched the first nine titles in a new range of leisure and educational programs for the Electron called the Factfile 500 Series.

Twenty programs are being released before Christmas, each containing 500 facts – a total of 10,000 questions, answers, facts and figures compiled by teachers and specialists and presented in multiple choice format.

Factfile 500 packs cost £3.95 each and are intended for use with any of the Kosmos Answer Back Quiz master programs.

Titles so far released are Arithmetic, Spelling, Natural History, General Science, Junior General Knowledge, Senior General Knowledge, Know Scotland, First Aid, and Sport.

The Factfile 500 programs are also available on disc for £5.45 each.

Electron is magic

A TOP UK magician has chosen an unusual co-star to help him cast a spell over audiences across the country – an Electron.

David Hambly, known professionally as "The Micro Wizard", is believed to be the only entertainer in the world to feature a home computer in his act.

With programs written by himself, the magician waves his magic wand to put the Electron through a series of astonishing "tricks".

Such has been his success of late that he has made guest appearances on Pebble Mill at One and Thames Television's Database.

On leaving school, David's first job was as a tea taster. However his real love remained the stage. Working part time as a magician soon took him to Germany, Belgium, Norway, Holland and Denmark.

It was while he was on the staff of a large electronics firm in Ilford that he began to get interested in computers. This in turn led to him introducing them into his act. Since then he's never looked back.

A member of the elite Magic Circle, David Hambly is the author of the world's first book on computer magic.

He is also currently writing a software package to enable Electron users to perform a complete one hour magic show.

David Hambly

"People have always said the Electron is magic", he says. "All I have done is set out to prove it".

Sideways ROM board

LATEST hardware development from Wizard is a sideways ROM expansion board for the Electron. Called the Sidewinder, it has full through bus connection and four sideways ROM sockets which allows peripherals such as the Plus 1 and disc drives to be used together.

Included in the package is a programmable joystick interface with Joy ROM. This is said to have 99 per cent success rate converting keyboard games to joystick. Price £39.95.

LONELY SERENADE IS OVER

A SOFTWARE/audio system for the Electron that takes the loneliness out of practising a musical instrument has been launched by a consortium of professional musicians and software writers called Music Play and Display Operating Systems.

Each twin cassette Micro-Maestro pack is tailored to suit a particular instrument or group of instruments and features contemporary music.

Learning musicians can practise with the program and, having gained confidence and ability, perform with full professional studio accompaniments.

The initial Micro-Maestro range comprises packages for keyboards, concert-pitch instruments, B-flat instruments and a recorder tutor.

Birthday bargains

A MAJOR exhibitor at all the Electron & BBC Micro User shows, Watford Electronics will be celebrating its 13th birthday during the November event.

The company, which started in a bedroom and grew to be one of the country's leading suppliers in the Acorn market, will mark the occasion with a number of "sensational" bargains.

"No one will have seen anything like it", Watford boss Nazir Jessa told *Electron User*. "It may be our birthday, but it will be our customers who end up with the presents. We intend to make sure of that". Such has been

Nazir Jessa

the success of the company over the years that it recently moved into a purpose-built £700,000 headquarters that reflect its current multi million pound annual turnover.

This now houses Watford's 30 staff and more than 7,000 different components and micro peripherals.

New board gives Electron speed of BBC Micro

A REMARKABLE range of new products designed to enable the Electron to perform as powerfully as the BBC Micro has been announced by Andyk.

The company says its £29.99 Fast Electron Board makes the speed of the machine in all modes comparable to that of the BBC Micro.

The increase in speed will allow BBC Micro software – where speed is the limiting factor – to run successfully on the Electron, says Andyk director George Rawlins.

"All Electrons can be modified easily and the changeover from fast to slow or vice versa can be switched. The increased speed and overall low power consumption is ideal for control applications", he added.

Capability

Also released by Andyk are a £34.99 RS 423 serial port which has drive capability and software interface similar to that of the BBC Micro and plugs into the Plus 1 cartridge slot.

Then there's a £9.99 eprom card which can take applications software and will also allow utility ROMs to be used.

Finally a £24.99 battery-backed sideways RAM will allow ROM software to be developed and downloaded via disc or tape.

Rawlins told *Electron User*: "My efforts have concentrated on bringing the Electron into the low cost control environment because the machine is more reliable than other micros in its range.

"This is due to the very large scale integration technology used within it, giving the added bonus of low power consumption.

"My company also intends to launch three other products in January to give the Electron more versatility in the control environment.

"These are a real-time clock, an extended I/O capability giving the Electron a user port, and a low-cost LCD display which will make the machine more portable".

COMPUTER'S PLACE IN THE CHURCH

THE recently-formed Christian Micro Users Association has pledged to support the Electron in its work of linking together computer users of various denominations and promoting the use of micros in church activities.

Association secretary Philip Clark told *Electron User*: "There is a great need to discover and make contact with the individuals and companies producing 'Christian software'.

"We also need to share the expertise and ideas of the many who have sought to use micros in their church-related activities".

The aim of CMUA is to concentrate on the popular home computers like the Electron and it has already unearthed a significant number of programs based on Bible studies.

Forum

The association intends to produce a quarterly magazine called Christian Micro and, from next January, launch a series of tape magazines for specific micros.

Its other activities will include the formation of local groups, arranging Christian micro exhibitions and conventions throughout the country, acting as a forum for the sharing of information about micros in the church, and promoting the highest quality Christian software.

War games club

SOFTWARE publisher Lothlorien has formed the Warmaster Club, an organisation for war game and adventure game enthusiasts, including Electron users.

There will be no charge for membership, says Lothlorien director Roger Lees. Members will receive regular detailed advance information about new war and adventure releases available through computer dealers.

"The additional benefit of club membership will be to offer a range of club only titles", says Lees, "some of which we hope to publish within the club on behalf of members who are software authors.

"It is hoped that the club will become a vehicle for publishing a range of low volume, special interest software which cannot justify the costs of full commercial publication".

Revision's easier on your micro

LEADING publishers of printed revision aids for secondary school students Charles Letts has launched Keyfacts Revision software for the Electron.

The eight programs are designed for use throughout the O-Level GCE, CSE and GCSE courses.

Letts says the programs act as a supplement and enhancement to book based learning rather than simply duplicating it.

Subjects covered are biology, chemistry, computer studies, English literature, geography, mathematics and physics.

The programs employ a variety of approaches to maximise the student's interest, the aim being to encourage active participation by the student in home studies, and they feature extensive use of graphics.

Price of each package is £11.50.

SOLIDISK EFS COMBINES DISC AND A SOCKET FOR THE WI

Solidisk Double Density DFS is now the ultimate in reliability and supported by the largest amount of software available for the Electron.
Solidisk relies on a good product and a large support network to win the heart of the user.
With over 75 Local Experts, covering England, Scotland and Wales, Solidisk can offer many users regional free fitting and advice.
With an ever increasing catalogue of free software, even users who are new to the Disc system can expect to build up a large library in a fairly short time.
Solidisk Software Support Service already has responsibility for over 50,000 BBC computer users and the ability to give you the best service matched only by the largest companies.
Solidisk Double Density DFS handles both BBC Discs and Electron Discs, in single and double density whereas the Acorn's PLUS 3 can only handle ADFS discs.
Solidisk ADFS has nice features such as automatic disc format sensing, built-in disc formatter and verifier and programmable disc speed.
It also has more than 20 disc utilities built into the ROM.
Standard features for both BBC DFS and ELECTRON ADFS implementations include:
1) Automatic Write Error Correction.
2) Automatic 40/80 track stepping, the ADFS 2.1 will let you read and write 40 trak discs if you have an 80 track drive.
3) Disc repair facilities.
Disc sector editor (*DZAP), memory editor (*MZAP), recover good sectors (*RECOVER) rewrite multiple sectors (*RESTORE), read bad sectors and bad track (*RTRACK), repair and restore bad sectors and track (*WTRACK) and the powerful disc copy (*DCOPY) which is capable of duplicating even some non BBC discs.
4) Tape to disc facilities.
Direct transfer from tapes to disc (*TAPEDISC) will work with all unprotected programs. *TAPELOAD and *TAPESAVE will cope with more difficult ones. Only in some cases (multipart games cassettes) will you need Solidisk tape copier.
5) Wordprocessing facilities.
This facility allows *BOOT and other text files to be edited, saved and printed in any screen mode.
6) Automatic disc format sensing.
On Shift-Break, the STL ADFS 2.1 will detect the disc format and use the right BBC DFS or Electron ADFS to run.
On the Electron ADFS side, the 2.1 ROM also has some very nice features:
1) Extensive Disc formatting facilities.
*FORM40, *FORM80, *FORM160 and *WFORM (for the Winchester) are available to handle any disc drive.
2) Disc verifying facilities.
*VERIFIFY will check all disc sizes including Winchester for media defects.
3) Number of opened channels.

This is the star feature of Solidisk ADFS.
This facility (*OPEN) allows you to specify how many files will be opened in a program, thus maximising the available RAM while avoiding buffer page swapping as on the Acorn ADFS.
It leaves PAGE at &1900 for most programs, gives more room to View and Viewsheet and avoids unnecessary conversion work for many programs originated for the BBC DFS to be run on your Electron.

On the BBC DFS side, the STL ADFS 2.1 handles both single and double density and in addition, it supports:
1) Unlimited catalogue entries.
2) Unlimited filesize.

THE SOLIDISK 16k SIDEWAYS RAM:

Solidisk Sideways RAM is an almost indispensible add-on for the Electron with disc drives.
The Sideways RAM occupies the same memory area as the BASIC or ADFS ROM in the micro's memory map. This means that Sideways RAM can run almost any ROM type software, including languages, utilities and games.
Sideways RAM is notably invaluable to run games and specially "MEGAGAMES".
Games and programs run at 2MHz clock speed in Sideways RAM, if loaded into the Electron RAM, they can only run at 1MHz clock speed, ie half the speed of Sideways based games.
Megagames are too large to be run on the unexpanded Electron. They use extensively 8 colour high resolution screen (mode 2), background music, sound and high speed sprites.
Solidisk supply free software to maximise the use of Sideways RAM on the Electron. These include Wordprocessor, Spreadsheet, Database, Toolkit, Machine Code Monitor, Printer Buffer, Sprites, Playtunes, Virtual Memory Processor, VDU Replay, Screen Effects, digitised pictures etc . . .

THE WINCHESTER SOCKET:

Solidisk has the most powerful Winchester system for the BBC computers and the Electron. The Winchester system can provide from 20 Megabytes to a theoretically possible 1300 Gigabytes of storage, directly on line with the Electron.
The same Winchester unit can be used on the BBC B, the BBC PLUS and the Electron without any change.
You can read more about it in BBC Micro User or in Acorn User Magazines. Price of a 20 Megabytes system is only £700.00 + VAT (£805.00).

SOLIDISK TECHNOLOGY LIMITED, 17 SWEYNE AVE, SOUTHEND-ON-SEA, ESSEX SS2 6JQ. TEL. SOUTHEND (0702) 354674 (10 lines).

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— One software package containing four 3.5" discs, detailed below.
— Full one year guarantee and 2 manuals.

PRICE: £200.00

You can also order as many Megagame Packs at the same time as you like. Each Megagame Pack consists of three 3.5" discs and contains on average 20 games.

THE SOFTWARE:

The software contains everything to start a library: the big four (Database, Wordprocessor, Spreadsheet and Graphic), Utilities and Games.

Database:

Solidisk Database is very easy to understand and use. You are presented with a 15 option Menu. Each option will lead to a new Menu and so on. Mode 3, 80 column screen is used throughout so that what you see is what will be printed on paper. With Solidisk Database, you can create as many records as you like, each record can be up to 15 fields of up to 60 characters. You can sort, search, index, mailmerge, append, create subset, calculate etc. Solidisk use the same Database to process all your orders.

Wordprocessor:

Solidisk Wordprocessor is WYSIWYG type (What You See Is What You Get) and has all the commands of a professional tool. It features 80 column screen, on screen justification, page numbering, search and replace, word count, free space, Wordstar like editing commands: insert and overwrite, block mark, move, copy, delete, save, load to cursor, * commands etc..

Spreadsheet:

Solidisk Spreadsheet is also Menu driven and has the same file structure as Solidisk Database. You can have as many rows and columns as you like, each column can be as small as two characters wide or as big as 70 characters. All maths functions are

supported. Recalculate, Replicate, Print, Print If, Sort, Search, Define Zone, Mailmerge, Text Input/Output etc . . . are included.

Toolkit:

Solidisk Toolkit is almost indispensible for Electron programmers, it has 24 star commands (Status, Rwipe, LVAR, Move, Search and Replace, Expand, Salvage, Keyload etc . . .).

ORDER FORM

PRICE LIST and ORDER FORM.	Price	P&P
Diskettes.		
Verbatim 3.5" box of 10	£40.00	£1.00
Software Pack	£10.00	£1.00
Solidisk EFS	£59.00	£1.00
Disc Offers.		
640k Mitsubishi MF453 Disc Outfit	£200.00	£3.00
1.3 MB Fantastic Offer	£310.00	£3.00
20 MB Winchester system	£805.00	£10.00
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Software Surgery

THE COLUMN THAT TAKES A LOOK INSIDE THE LATEST RELEASES

Paintbox is a big draw

Paintbox II
Beebugsoft

BEEBUGSOFT have steadily gained a good reputation among owners of the BBC and Electron micros, and so I was pleased to receive this cassette for review.

There have been other drawing packages for the Electron, and it is perhaps important to look for enhancements and original features.

One telling point for this program is that there are too many options to fit into the main menu, and so there are some placed onto a secondary menu which has to be accessed from the first.

The options are "acquired" in a rather ikon-like style, with the cursor being moved by the keyboard or joystick to the symbol.

Certain "dangerous" options have to be acquired twice by the Space bar, thus providing a safety net for unwary users.

Working in Mode 0, 1 or 2, there is a wide range of colours available, with the most colourful screens, of course, in Mode 2.

Shapes can be drawn using a continuous row of dots, using any colour, with colour changes being easily made at any point.

The dot can be replaced by a brush of variable width, and also variable shape, including a very powerful option to define your own shape of brush.

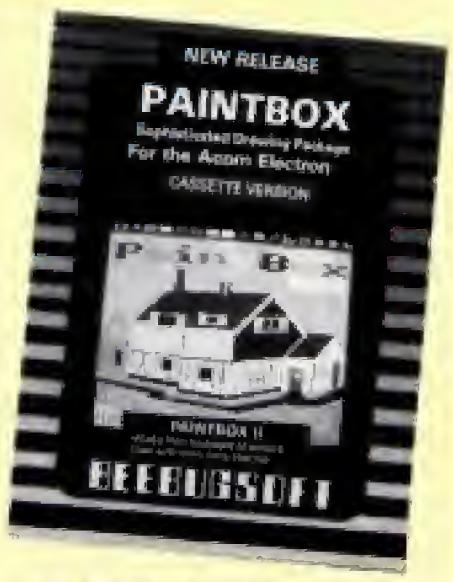
Just these few options kept me occupied for quite a while as I explored their potential by drawing variations of triangles, rectangles, circles and more complex shapes.

As is almost standard now, there's a rubber band facility. This allows for accurate placement of shapes by showing what is about to appear on-screen just before the final selection is made.

Indeed, another colour may still be chosen while in this mode, thus increasing the possibilities.

Shapes can be infilled, although complex shapes tend to need several attempts.

Text can easily be interspersed with the graphics, and this is just one of the range of features whose use is clearly displayed in the accompanying 48-page booklet.



This is essential reading if the true potential of this system is to be fully explored and exploited.

With GCOL options available, and the colour palette changeable, there is enough to bewilder or excite any user.

I have used other drawing packages on the Electron, but I haven't found a better one yet.

Phil Tayler

Rousting robots aids your maths

Quick Thinking Plus
Mirrorsoft

THIS package by Mirrorsoft contains two games for youngsters, Sum Vaders and Robot Tables. Both programs are designed to give practice in number skills.

Sum Vaders requires you to use some quick thinking to stop the invasion of robots.

Addition, subtraction, multiplication and division problems are presented and you have to get the answer right first time.

An alien spacecraft bearing a number moves across the screen. It releases a robot invader which also has a number.

The object of the game is to destroy the robot before it reaches the ground. To do that you have to type the correct response to the sum.

In the addition option, you have to add the two numbers, while the subtraction option has you taking the smaller number from the larger.

The product is entered in the multiplication option and the smaller number is shared into the larger in the division option.

As your skills increase, so

→

Sports quiz scores good points

Answer Back Sports Quiz
Kosmos

KOSMOS has developed quite a reputation for its Answer Back programs, and the latest addition to the collection, the sports quiz, keeps up the good work.

What you get for your money is more than 750 questions divided into 26 categories.

These must cover just about every area of sport.

The questions can be multiple choice, or yes/no answers. The whole program is regarded as a sporting contest—you against Kosmos.

Every time you get a question wrong, it's a point for Kosmos. But if you get one enjoyable to play.

For each correct answer you also get three credits, and these credits can be cashed in for a choice of two games – football or tennis.

In football, you keep goal against a very competent Kosmos forward line, while in tennis you score points each time you hit the ball.

Apart from the set questions, the program gives you the ability to create your own quiz.

This doesn't need to have a sporting theme – I've used it to create questions on science topics.

This program is well-written and bug-free. The games, while not arcade standard, demand some skill and are enjoyable to play.

The main menu is clear and easy to use.

Rog Frost

From Page 13

does the difficulty, the attackers coming in lower and faster. Your turn ends when five aliens get past and land on Earth.

There are five levels of difficulty for the adding and subtracting options. Only three levels are available in the multiplication and division options.

A nice feature of this program is that two people can play in competition, each player at his own level of difficulty. This enables a child to compete with an adult, yet still be able to win.

In the two-player game, high scores are separately recorded.

The second program, Robot Tables, is based upon a manic machine designed to frustrate the would-be mathematician.

The aim of the exercise is to create robots – in contrast to Sum Vaders, where the object was to destroy them.

The robots are produced from lumps of raw material that is fed in from the left-hand side.

Each lump contains a number. You have to decide whether that number is the next one in the sequence that is displayed below.

If you reject good material – a correct answer – or if you accept bad material – a wrong answer – the machine makes a damaged robot.

If the material is OK and it is accepted by you, a perfect robot is produced. If you correctly reject bad material it's recycled.

Points are credited for material recycled and each undamaged robot produced.

Bonus points are given for every sequence of ten robots that are created.

There are two modes for the game – learning and testing. In the learning mode the correct sequence of numbers is first displayed.

There are much longer response times and answers are displayed after each robot is made.

The testing mode is much faster and points are lost for incorrect responses.

I'd be happy to use the programs with most youngsters.

John Woollard

Tarzan's a right terror

Tarzan Boy
Alligata

THIS is a four screen arcade game set deep in the jungle. You take the part of Tarzan and the object is to find Jane.

Tarzan starts on the first screen and Jane is on the last. All you need to do is follow the arrow signs which will take you to her.

It might not sound difficult but, after an hour's play I had only managed to master screen one – and that's the easiest.

All the dangers to be found in the jungle are here – gorillas will crush you, poisonous snakes will bite you and monkeys will drop coconuts on your head.

There are also waterfalls, rivers with floating logs and crocodiles to overcome.

In addition to these obstacles are the usual collection of mean-looking nasties.

Screen one involves ducking under a snake slithering down from a tree. Just past this are several lifts which take you up to different platforms.

Next you have to leap across a deep chasm to another platform. Watch out for the monkey with coconuts here.

Then jump the next chasm, up the lift and wait for a particularly nasty disembodied head with gnashing teeth to move to the correct position.

A couple of leaps and it's on to the next screen.

Tarzanboy is a Mode 2 game with a surprising number of moving objects. The Electron isn't noted for it's speed in this mode, but although Tarzan moves a little slowly, generally the animation is fast and smooth.

You won't be disappointed with Tarzan Boy. It's one of the best levels type of game released in the past couple of months. **Roland Waddilove**

Golden battle

Beach-Head
US Gold

IT'S time to get your tin hats out and lead the assault on the enemy territory in Beach-Head.

This is one of the first conversions of their legendary Commodore 64 software, and it's great.

By moving the cursor which represents your forces, you can select one of two opening scenarios.

In the first you must guide your fleet through a narrow channel which is mined and is constantly criss-crossed by enemy torpedoes.

You score for every ship successfully negotiating the channel, but you inevitably lose a few ships.

The second option is to skip this section and proceed with a full complement of 10 ships to the anti-aircraft game.

This part of the game is great fun – enemy aircraft dive at your ship with guns blazing.

You now take on the role of gunner, moving the gun up, down, left and right, pumping out shells at wave after wave of fighters.

Speed and accuracy are

A look at artificial intelligence

Talkback
Acornsoft

SOME while ago, when computers were things owned by rather strange people with more money than sense, I went to see a program called Eliza.

It was almost the first program I can remember seeing, and it made a great impression on me.

It seemed that the computer could be spoken to through the keyboard, and that it actually answered back in an intelligent manner.

Such programs are old hat now, but this cassette might be interesting for those keen on Artificial Intelligence, for it gives a marvellous insight into the way such a program is written.

The main menu allows several options, one of which is to load a character from tape.

Two are provided, Astro and Bomb, and fans of the film and book Dark Star will have the opportunity to convince the bomb to return to the docking bay . . .

The accompanying booklet gives quite detailed instructions on how to decide the characteristics of other people, through the examples of Helen and Ron.

Creating or altering a character is fairly straightforward once a little familiarity is gained.

Keywords – including short phrases – and responses can be entered or altered, so that fairly predictable conversations can be held, either between the two selected characters, or between the user and one of these.

The same keyword could provoke differing responses, but there is a priority system which decides which response should occur.

Actually, I found the conversations themselves to be rather repetitive and bland, and I was much more interested in the actual designing of characters.

The average Electron owner will probably get fed up with the possibilities fairly quickly, but those with a particular interest in this area will find it most worthwhile.

Phil Tayler

essential here, as with each hit from the enemy your damage points increase.

Each time the total reaches 20 damage points you lose another ship.

The enemy planes defeated, their fleet now comes into play.

My first attempts at lobbing shells at silhouettes of enemy vessels were disastrous.

I then noticed a small notice on the display informing me of how long or short my last shot was – aren't computers wonderful?

Having survived this melée, the surviving ships head for the beach and land their cargo of tanks – the number of tanks landed being proportional to the number of surviving ships.

The tanks must be guided through a tortuous maze of tank traps and gun emplacements.

Finally they reach their target – a huge gun mounted on top of a hill. The hill is protected by numerous guns which must be eliminated before the large gun is destroyed.

The graphics are excellent, and the fact that your performance on each level determines your fire-power on the next is a great idea.

James Riddell

This Lisp is a real snip

Lisp – ROM Cartridge
Acornsoft

THIS was one of the first languages to appear on cassette for the Electron, and at last the full implementation is available on ROM cartridge for the Plus 1.

Priced at £29.95 it may seem expensive, but represents a considerable advance on the tape version reviewed in *Electron User*, February 1985.

The Lisp cartridge takes precedence on power-up, and typing VERSION tells us that this is version 5.

Turn on the garbage collector messages and force a collection, and we find we have 16.6k available in Mode 6. The extra memory available to the ROM based Lisp allows several enhancements – larger programs, graphics, neater recursive functions instead of loops, and less time garbage collecting.

Apart from these benefits of extra memory, how much more do you get for your well-earned money?

I knew that Lisp came on a 16k ROM, and was surprised to see the cartridge contained 10 example programs, including games, educational programs, utilities and graphics. I was even more surprised when I couldn't find these programs in the ROM on disassembly. Efficient packing? Tokenising? No, the cartridge also contains a 16k serial ROM.

The examples are all taken from the Acornsoft book, which must be bought separately, and are loaded by selecting the ROM filing system, and *EXECing the file.

When you need, say, a sort function, this can be read from ROM as if it were typed from the keyboard, thus saving time and energy.

In a language where every machine has its own dialect, Acornsoft Lisp could well set some form of standard for micro-Lisps.

There's no PROG function, but Lisp being the friendly, flexible language that it is, this can be defined if you simply cannot do without GOTOs.

The OBLIST contains 130 indentifiers, compared to 114 for the tape. Extra facilities include MODE, USR, binary operators, TIME/CLOCK functions, warm or cold start from a break, and textual error messages.

The lack of a MODE command was the only serious drawback of the cassette, which included lots of functions (ONEP, ZEROP, ADD1, SUB1, CAR/CDR combinations) which are very easily defined in Lisp.

The VDU22 command can be used to change from one mode to another that use the same amount of RAM, say from 4 to 5, but not from Mode 6 to 3.

Since MODE has a delayed effect – it waits until the next Evaluate: prompt is displayed, there may still be occasions when VDU22 is needed, but in general MODE is a very useful function to have.

There is, however, a serious problem with this Lisp – it is extremely difficult to get hold of.

This is a great shame, because it is a superb implementation of an exceptionally interesting computer language, and 32k of ROM at this price is a real bargain.

Nick Rhodes

QUICK PEEKS

Whoopsy: *Baby wants to play with his toys but Mummy wants him in bed. The baby distracts her by leaving whoopsies, but he must watch out for the patrolling potties. As you progress through the screens there are more toys to play with and more potties to contend with.* (Shards)

★ ★ ★

Woodbury End: *An illustrated adventure set in a quiet English village. You wake up in a darkened room tied with a rope and your memory a blank. In this real time adventure you have 20 days in which to unravel the sinister secrets of Woodbury End.* (Shards)

★ ★ ★

Robin of Sherwood: *It is over 100 years since the Normans conquered England, but rebellion still flares. Many English secretly believe a Hooded Man – a fugitive – would be chosen by Herne the Hunter to lead the English against the Norman tyranny. This time is now ready for the appearance of the Hooded Man – you. This Scott Adams' adventure includes features such as the stringing together of commands and input of complete sentences. A free hint sheet is included with the game.* (Adventure International UK)

★ ★ ★

Competitive Maths: *Improve your mental arithmetic by beating the clock to a new high score. The idea is to answer as many quick-fire questions as possible within a minute. You can choose any of addition, subtraction, multiplication or division – with varying skill levels.* (Duckworth)

★ ★ ★

Terrormolinos: *A text adventure of a holiday spoof set on the Costa Brava, in which you must survive a two-week package holiday and return home with 10 snapshots to prove it. In this witty game every holiday disaster can and does occur.* (Melbourne House)

★ ★ ★

Shuffle: *A sliding block puzzle of the traditional type. You have to unscramble a puzzle made up of a number of blocks, one of which is a blank. There are two sets of control keys. One set moves the blank and the other moves blocks into the blank. The idea is to solve the puzzle in the fewest possible moves and the shortest possible time. There are eight different puzzles with three levels of difficulty.* (Budgie)

★ ★ ★

West: *It is the year 1884 somewhere in the Wild West. You are on the track of a notorious gang of robbers who have gone to ground near an abandoned mining town, deep in Indian territory. Your objective is to gain promotion to the rank of Marshal by outwitting the robbers and collecting as much of their loot as possible.* (Talent Computer Systems)

★ ★ ★

Chuckee: *An upgrade for Chuckie Egg which enables you to change the numbers and positions of the walls, ladders, seeds, geese and conveyors. In effect, you can design your own screens. However, you need to own a copy of the original before you can use Chuckee.* (Bit Twiddlers)

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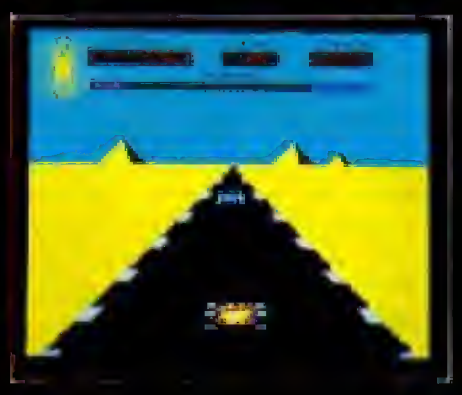

OVERDRIVE (32K) **£7.95**

A highly-addictive multi-stage 3D race game. You steer your car left and right, accelerate and decelerate as the opposing cars weave about the road. There are five different stages including night, snow, desert and riverside scenes. To qualify for the next stage, you must finish in the top twelve. Incredible graphics give the impression that you really are taking part in the race. Highly recommended, and destined to become another top-seller for Superior Software.

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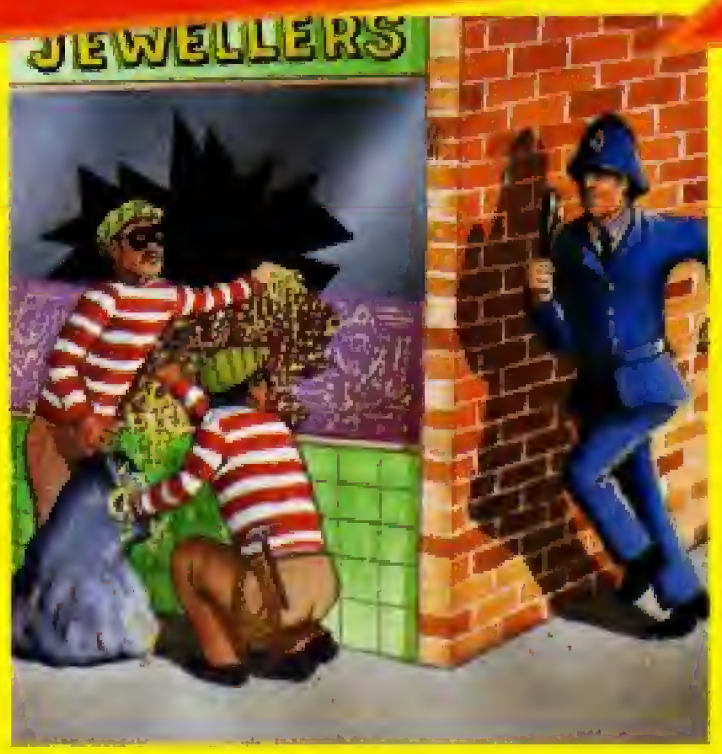

SMASH AND GRAB (32K) **£7.95**

An excellent and original arcade-style game in which you take the role of a robber aiming to snatch bags of gold from the bank. A policeman is after you ... he is able to jump at you or squat down and try to hit you with his truncheon. You must also keep clear of the flying police cones and floating dustbin lids. There are three fascinating screens of action including play streets with bouncing balls, one-way streets, conveyor belts, traffic lights and police-boxes. A novel and amusing game.

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MISSILE ATTACK

By MIKE WARMAN

MISSILE Attack is a version of the popular arcade game in which you must destroy incoming missiles with your laser bases.

If enough missiles get through – five or more – your city is destroyed and you along with it.

If you clear one screen you go to another with more and faster missiles and fewer shots with your lasers.

The program is run mainly in Mode 4 for speed but still uses colour and sound to good effect. The top ten hi-scores are displayed at the end of each game.

The program uses integer variables to increase speed. For this reason REM statements are also omitted.

The number of missiles can be changed by altering the value of N% at line 410 and their speed changed by altering the value of U% at line 510.

The title page and other double height characters are achieved by poking into the Mode 4 screen memory, which starts at &5800.

The micro looks at the character generator in ROM and pokes the value that it finds into the screen.

Each character square is defined by 8 bytes. PROCbigchars is used to do the screen poking.

The letters are held in data statements at lines 2390 and 2400.

Three different short tunes are played in the game. The notes to be used and their lengths are also stored in data statements.

To give the ten highest scores a short bubble routine is used – PROCsort, lines 2440 to 2510.

VARIABLES

A%	Number of shots left on laser 1.
B%	Number of shots left on laser 2.
C%	Number of shots left on laser 3.
D%	Number of missiles destroyed within a level.
E%	Number of missiles let through in a level.
F%	Used for recursive loops.
H%	Horizontal position of gun sights.
V%	Vertical position of gun sights.
J%	Total number of missiles let through.
L%	Level number.
N%	Number of missiles.
I%	$\frac{1}{3}$ of *N*%.
O%	$\frac{1}{3}$ of *N*%.
R%	Decides missiles' path.
U%	Speed of missiles.
W%	Flag to indicate whether laser can fire.
Q%	Horizontal position of base which is firing missiles.
m%	Starting address in screen memory for double height characters.
M%	Position in screen memory in which the computer is currently poking.
h%	Increment for *M*%.
S%	Start of character generator in ROM.
SCORE%	Total score.
X ( )	x coordinate of missiles.
Y ( )	y coordinate of missiles.
hi ( )	Keeps hi scores.
NA$ ( )	Keeps names of hi scores.
Z%	Sound flag.

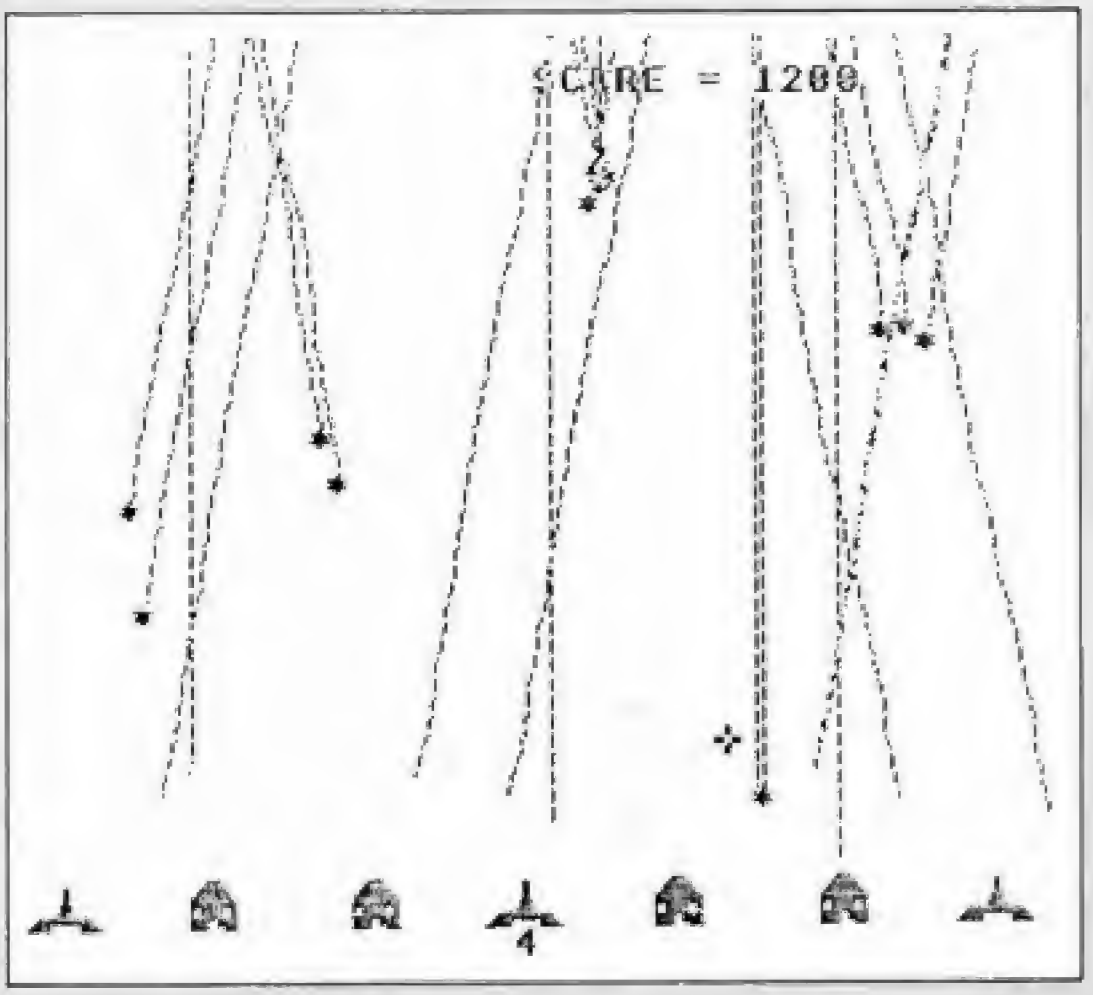
PROCEDURES

lose	Inputs name, calculates and displays hi score, restarts program.
keys	Checks key pressed, takes appropriate action.
fire	Fires laser from selected missile base and checks for hits.
one,two,three	Keeps tabs on number of missiles left.
win	Called when you destroy all the missiles, prints running score and level number.
bigchars	Pokes double height characters on to the screen.

Full listing starts on Page 18

Missile Attack listing

From Page 17




```
   10REM Missile Attack
   20REM By M.I.Warman
   30REM (c) Electron User
   40REM
   50ENVELOPE1,2,-15,-8,-3,
10,10,10,126,0,0,-126,126,1
26
   60DIMhiX(10):DIMNA$(10)
   70DIMYX(100),XX(100):ZX=
1
   80MODE4
   90GCOL4,7:VDU23;10,32;0;
0;0;
  100GOSUB1720
  110*FX12,15
  120CLS
  130VDU23;10,32;0;0;0;
  140VDU19,7,7;0;
  150EX=0
  160ENVELOPE2,1,3,-5,2,3,4
,3,126,0,0,-126,126,126
  170JX=0:LX=0:NX=0:SCOREX=
0
  180VDU23,224,0,0,0,24,24,
24,24,24
  190VDU23,225,0,0,0,15,31,
63,127,255
  200VDU23,226,0,0,0,224,24
0,248,252,254
  210VDU23,227,60,60,126,25
5,255,255,0,0
  220VDU23,228,0,0,3,7,15,3
1,63,127
  230VDU23,229,0,0,192,224,
240,248,252,254
  240VDU23,233,255,255,255,
255,255,255,255,255
  250VDU23,230,127,127,79,7
9,127,126,126,126
  260VDU23,232,24,24,24,231
,231,24,24,24
  270VDU23,231,254,254,230,
230,254,126,126
  280PRINTTAB(0,0);" "
  290SX=0:DX=0:EX=0
  300PRINTTAB(35,30);CHR$22
5;CHR$227;CHR$226;TAB(36,29
);CHR$224
  310PRINTTAB(18,30);CHR$22
5;CHR$227;CHR$226;TAB(19,29
);CHR$224
  320PRINTTAB(1,30);CHR$225
;CHR$227;CHR$226;TAB(2,29);
CHR$224
  330PRINTTAB(7,30);CHR$230
;CHR$231;TAB(7,29);CHR$228;
CHR$229
  340PRINTTAB(13,30);CHR$23
0;CHR$231;TAB(13,29);CHR$22
8;CHR$229
  350PRINTTAB(24,30);CHR$23
0;CHR$231;TAB(24,29);CHR$22
8;CHR$229
  360PRINTTAB(30,30);CHR$23
0;CHR$231;TAB(30,29);CHR$22
8;CHR$229
  370PRINTTAB(20,1);"SCORE
= 000"
  380VDU5
  390GCOL4,3
  400VX=500:HX=640:MOVEHX,V
X:PRINTCHR$232
  410NX=RND(6)+17+(2*LX)
  420IFLX>7THENNX=RND(6)+29
  430IX=INT(NX/3):OX=INT(2*
NX/3)
  440IFAX<4THENAX=4
  450AX=10-LX:BX=10:CX=10
  460IFAX<4THENAX=4
  470FORFX=0TONX
  480XX(FX)=RND(1000)+160
  490YX(FX)=RND(140)+1000
  500NEXT
  510UX=5+(2*LX)
  520IFLX>7THENUX=18
  530KX=22-(2*LX)
  540IFLX>7THENUX=21:KX=6
  550REPEAT
  560A$=INKEY$(0):IFA$<>""T
HENPROCkeys
  570FORFX=0TONX:PLOT69,XX(
FX),YX(FX):NEXT
  580RX=RND(2)
  590IFRX=2THENFORFX=0TOIX:
XX(FX)=XX(FX)+2:NEXT
  600RX=RND(2)
  610IFRX=1THENFORFX=0ITONX
:XX(FX)=XX(FX)-2:NEXT
  620A$=INKEY$(0):IFA$<>""T
HENPROCkeys
  630FORFX=0TONX:YX(FX)=YX(
FX)-UX:NEXT
  640A$=INKEY$(0):IFA$<>""T
HENPROCkeys
  650FORFX=0TONX
  660IFYX(FX)<28ANDYX(FX)>K
XTHENVDU19,7,5;0;:EX=EX+1:S
OUND1,2,10,14*IX:FORGX=0TO1
000:NEXT:VDU19,7,7;0;
  670NEXT
  680IFJX+EX>=5THENPROCclose
:CLS:GOTO120
  690UNTILDX+EX=NX+1
  700PROCwin:CLS:GOTO280
  710DEFPROCclose:VDU4:PRINT
TAB(7,14);"YOU HAVE BEEN DE
STROYED":VDU19,7,12;0;
  720RESTORE2430
  730FORFX=0TO6
  740READa,b
  750SOUND1,-15+IX,a,b*8+IX
:SOUND1,0,0,2*IX
  760NEXT
  770FORFX=0TO20000:NEXT
  780VDU19,7,7;0;:CLS
  790UNTILL=1
  800VDU4:PRINTTAB(10,10);"
YOU HAVE LOST"
  810VDU23;10,32,0;0;0;
  820PRINTTAB(3,16);"The mi
ssiles fired at your city b
y  alien attackers have su
cceeded in their attempts.Y
ou have been unable to stop
   enough getting through a
nd have perishedalong with
the rest of the city"
  830SCOREX=SCOREX+SX:PRINT
TAB(3,24);"SCORE = ";SCOREX
  840*FX21,0
  850IFSCOREX>=hiX(10)THENP
RINTTAB(3,27);"Input Name "
;:INPUTNA$(10):hiX(10)=SCOR
EX
  855IF LEN(NA$(10))>16THEN
PRINTTAB(14,27);"
          ":GOTO850
  860FORFX=10TO2STEP-1
  870IFhiX(FX)>hiX(FX-1)THE
NPROCsort
  880NEXT
  890CLS:RESTORE2400
  900aX=&5C38:nX=0
  910REPEAT
  920READA$
  930IFVALA$>0THENaX=VALA$:
nX=0:GOTO960
  940PROCbigchars(ASC(A$))
  950nX=nX+8
  960UNTILA$="s"
  970RESTORE2410
  980FORFX=0TO5
```

```
 990READc,d:SOUND1,-15+ZX,
c,d*4+ZX
 1000SOUND1,0,10,2+ZX
 1010NEXT
 1020FORFX=1TO10
 1030PRINTTAB(0,6+(2*FX));h
iX(FX);TAB(14,6+(2+FX));".
. .";TAB(20,6+(2*FX));NA$(F
X)
 1040NEXT
 1050VDU19,7,14;0;
 1060PRINTTAB(2,30);"PRESS
'A' TO HAVE ANOTHER GO";
 1070A$=GET$
 1080IFA$<>"A"THEN1070
 1090VDU19,7,7;0;
 1100ENDPROC
 1110END
 1120DEFPROCkeys
 1130IFA$="B"ORA$="N"ORA$="
M"THENPROCfire:ENDPROC
 1140MOVEHX,VX:PRINTCHR$232
 1150IFA$="X"THENHX=HX+70
 1160IFA$="Z"THENHX=HX-70
 1170IFA$=";"THENVX=VX+70
 1180IFA$="/"THENVX=VX-70
 1190MOVEHX,VX:PRINTCHR$232
 1200ENDPROC
 1210DEFPROCfire
 1220MOVEHX-20,VX:PRINTCHR$
233;CHR$233
 1230MOVEHX-20,VX+32:PRINTC
HR$233;CHR$233
 1240IFA$="B"THENPROCone
 1250IFA$="N"THENPROCtwo
 1260IFA$="M"THENPROCthree
 1270IFWX=1THENWX=0:GOTO137
0
 1280SOUND1,1,10,12+ZX:VDU1
9;1;0;19,7,4;0;
 1290MOVEQX,90:DRAWHX,VX
 1300FORFX=0TONX
 1310IFABS(XX(FX)-HX)<47 AN
DABS(YX(FX)-VX)<47 THEN MOV
EXX(FX)-16,YX(FX):PRINT"*":
YX(FX)=-40:DX=DX+1:SX=SX+10
0:SOUND1,2,0,5+ZX
 1320NEXT
 1330VDU4:PRINTTAB(20,1);SX
 1340VDU5
 1350MOVEQX,90:DRAWHX,VX
 1360VDU19;0;0;19,7,7;0;
 1370MOVEHX-20,VX:PRINTCHR$
233;CHR$233
 1380MOVEHX-20,VX+32:PRINTC
HR$233;CHR$233
 1390ENDPROC
 1400DEFPROCone
 1410QX=90
 1420IFAX>0THENAX=AX-1:VDU4
:PRINTTAB(2,31);AX;:VDU5
 1430IFAX=0THENWX=1
 1440ENDPROC
 1450DEFPROCtwo
 1460QX=620
 1470IFBX>0THENBX=BX-1:VDU4
:PRINTTAB(19,31);BX;:VDU5
 1480IFBX=0THENWX=1
 1490ENDPROC
 1500DEFPROCthree
 1510QX=1160
 1520IFCX>0THENCX=CX-1:VDU4
:PRINTTAB(36,31);CX;:VDU5
 1530IFCX=0THENWX=1
 1540ENDPROC
 1550DEFPROCwin:VDU4
 1560VDU23;10,32,0;0;0;
 1570VDU19;0;0;19,7,3;0;
 1580LX=LX+1:JX=JX+EX
 1590RESTORE2420
 1600FORFX=0TO7
 1610READa,b
 1620SOUND1,-15+ZX,a,b*4+ZX
:SOUND1,0,0,1
 1630NEXT
 1640CLS:VDU4:PRINTTAB(3,9)
;"You have destroyed all th
e incoming  missiles";
 1650SCOREX=SCOREX+SX
 1660IFJX=0THEN1670 ELSEPRI
NT" apart from ";JX;" which
 got through"
 1670PRINT:PRINTTAB(3,11);"
You now go on to the next l
evel whichis level number "
;LX+1
 1680PRINTTAB(10,16);"Score
 so far = ";SCOREX
 1690PRINTTAB(10,18);"Score
 in last round = ";SX
 1700*FX21,0
 1710PRINTTAB(2,30);"Press
 any key to continue":G=GET:
VDU19,7,7;0;:ENDPROC
 1720REM intro routine
 1730RESTORE2390
 1740SOUND1,1,10,48+ZX
 1750aX=&69D0:nX=0
 1760REPEAT
 1770READA$
 1780IFA$="!"THEN1820
 1790IFVAL(A$)>0THENaX=VAL(
A$):nX=0:GOTO1820
 1800PROCbigchars(ASC(A$))
 1810nX=nX+8
 1820UNTILA$="!"
 1830MOVE0,300:MOVE1100,300
:PLOT85,550,900
 1840MOVE300,450:MOVE800,45
0:PLOT85,550,700
 1850MOVE300,1000:MOVE800,1
000:PLOT85,550,700
 1860PRINTTAB(8,30);"Press
any key";
 1870REPEAT
 1880FORFX=1TO7
 1890VDU19,7,FX;0;
 1900FORGX=0TO1000:NEXT
 1910NEXT
 1920UNTILINKEY$(0)<>""
 1930VDU19,7,7;0;
 1940MODE1
 1950VDU23;10,32,0;0;0;
 1960COLOUR2:PRINTTAB(13,4)
;"MISSILE ATTACK"
 1970COLOUR3
 1980PRINTTAB(3,9);"In miss
ile attack you are in charg
e  of the defences of your
race's last cityYou have th
ree laser bases each of whi
chcan fire only a certain n
umber of times.You must use
 these to destroy incoming
 missiles";
 1990PRINT" which have been
 launched from ahostile ali
en space ship overhead"
 2000PRINT"   You control t
he firing of the laser  bea
ms by positioning a gun sig
ht and    selecting a laser
"
 2010PRINT''"Do you want so
und effects during the    g
ame (Y/N)"
 2020A$=GET$
 2030IFA$="Y"THENZX=1
 2040IFA$="N"THENZX=0
 2050IFA$<>"Y"ANDA$<>"N"THE
N 2020
 2060COLOUR1
 2070COLOUR1
 2080PRINTTAB(4,31);"PRESS
ANY KEY TO SEE CONTROLS";
 20906=GET:CLS
 2100COLOUR3
 2110PRINTTAB(3,5);"You use
 the following controls to
   move the aiming sight ar
ound the screen:"
 2120COLOUR1
 2130PRINTTAB(3,9);"Z - Mov
e to left"
 2140PRINTTAB(3,11);"X - Mo
ve to right"
 2150PRINTTAB(3,13);"* - Mo
ve up"
 2160PRINTTAB(3,15);"? - Mo
ve down"
 2170COLOUR3
 2180PRINTTAB(3,18);"To fir
e a shot from each of the t
hreelaser bases press the k
eys B , N , or M"
 2190PRINTTAB(3,21);"As you
 move from screen to screen
 themissiles become more nu
merous and they  increase i
n speed.The amount of shots
   that you have also becom
es less."
 2200PRINTTAB(3,25);"It tak
es a total number of five
    missiles to destroy you
r city"
 2210COLOUR2
 2220PRINTTAB(4,31);"PRESS
ANY KEY TO START GAME";:G=G
ET
 2230MODE4
 2240RETURN
 2250DEFPROCbigchars(aX)
 2260IFaX=-1THENaX=32
 2270sX=&BF00+(aX*8)
 2280MX=aX+nX
 2290FORFX=sXTOsX+7
 2300?MX=?FX:?(MX+1)=?FX
 2310MX=MX+2
 2320NEXT
 2330MX=MX+312
 2340FORFX=sX+4TOsX+7
 2350?MX=?FX:?(MX+1)=?FX
 2360MX=MX+2
 2370NEXT
 2380ENDPROC
 2390DATAM,i,s,s,i,l,e, ,A,
t,t,a,c,k,!
 2400DATAH,i, ,-, ,S,c,o,r,
e,s
 2410DATA100,1,96,.75,100,.
25,100,1,96,1,100,2
 2420DATA100,.5,100,1,100,1
,100,1,80,1,100,1,80,1,100,
2
 2430DATA60,1,60,1,60,1,56,
1,48,1,48,1,48,2
 2440DEFPROCsort
 2450vX=hiX(FX)
 2460hiX(FX)=hiX(FX-1)
 2470hiX(FX-1)=vX
 2480N$=NA$(FX)
 2490NA$(FX)=NA$(FX-1)
 2500NA$(FX-1)=N$
 2510ENDPROC
```

This listing is included in this month's cassette tape offer. See order form on Page 61.

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Ready Reference

Collect the Electron User Ready Reference charts – and have all the facts at your fingertips!

MODES

The Electron has 7 modes. Five can support both text, letters, and graphics. Two are text only.

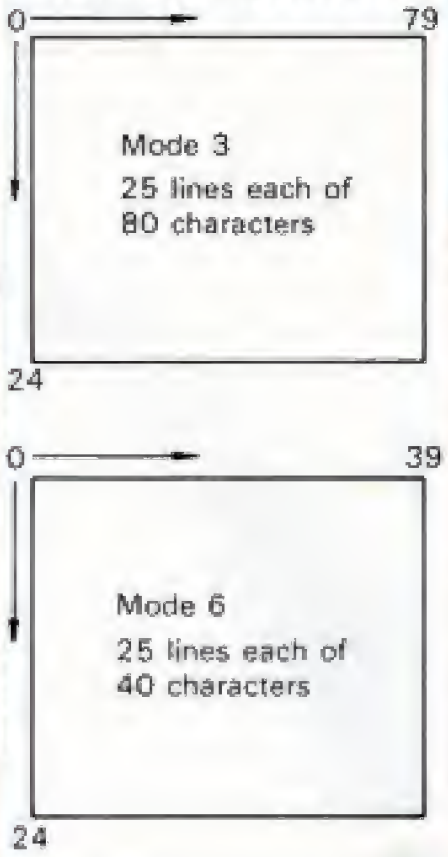
Function	Mode
Graphics Text	0,1,2,4,5 3,6

COLOURS

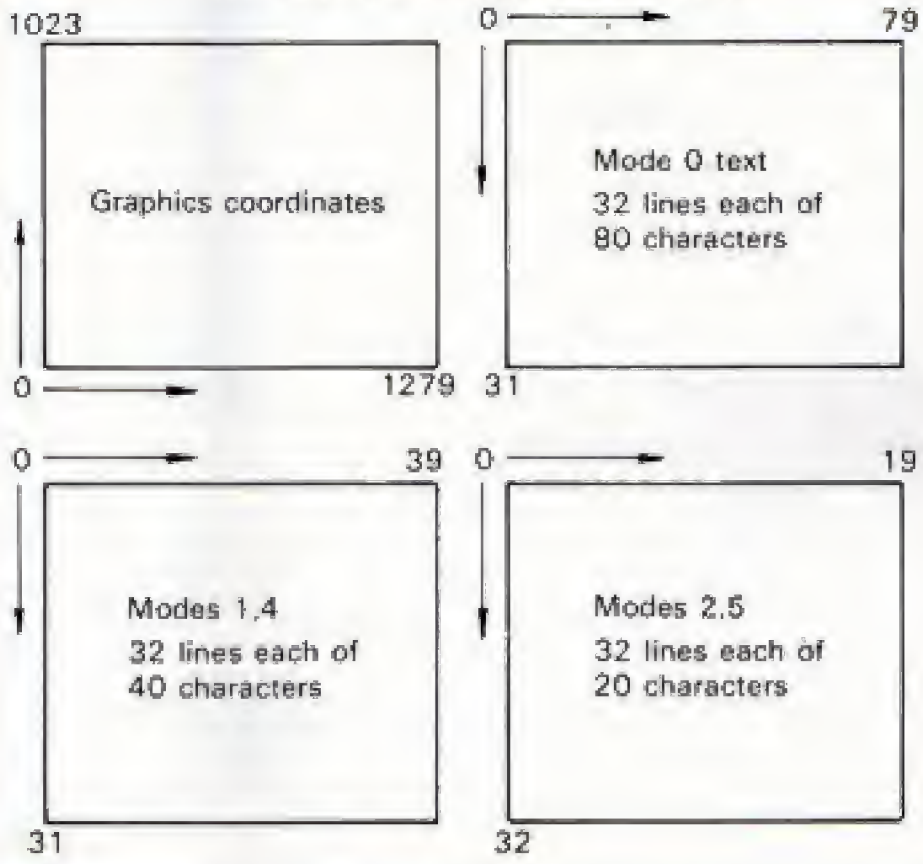
The Electron can have up to 16 colours, 8 flashing, but only Mode 2 allows all 16 on the screen at one time. Other modes have to make do with fewer.

Colours	Mode
2 4 16	0,3,4,6 1,5, 2

TEXT SCREEN LAYOUTS



GRAPHICS SCREEN LAYOUTS

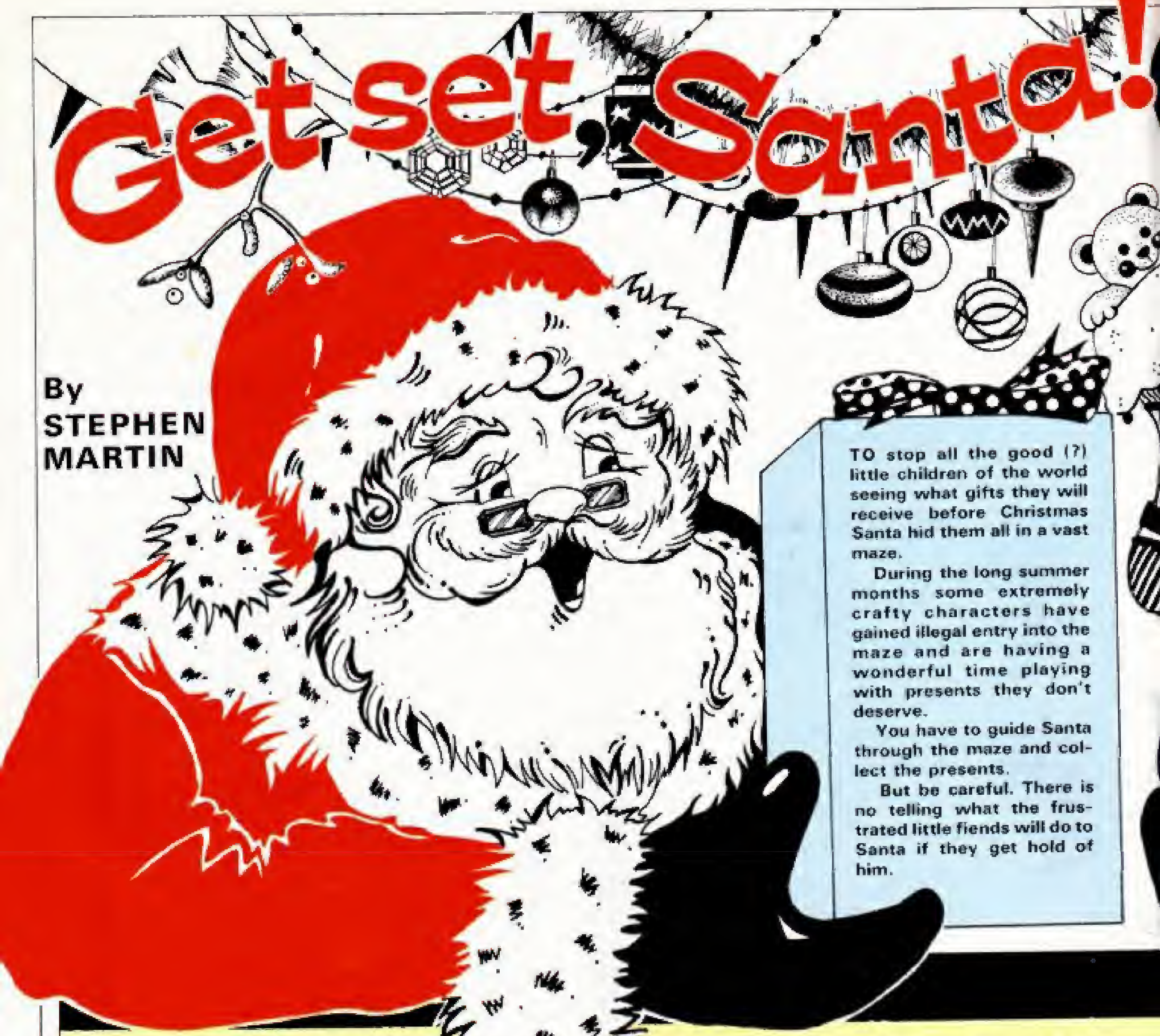


GRAPHICS MODES SCREEN ATTRIBUTES

Mode	Pixel size	Letter size
0	4 2	32 16
1,4	4 4	32 32
2,5	4 8	32 64

get set, Santa!

By STEPHEN MARTIN



TO stop all the good (?) little children of the world seeing what gifts they will receive before Christmas Santa hid them all in a vast maze.

During the long summer months some extremely crafty characters have gained illegal entry into the maze and are having a wonderful time playing with presents they don't deserve.

You have to guide Santa through the maze and collect the presents.

But be careful. There is no telling what the frustrated little fiends will do to Santa if they get hold of him.

```
  10REM Get Set Santa
  20REM By S.Martin
  30REM Interrupt Music
  40REM By R.A.Waddilove
  50REM (C) 1985
  60REM Electron User
  70MODE5:DIM hi%(10),na$(
10):FORT%=1TO10:hi%(T%)=200
:na$(T%)="STEVO":NEXT:PROCm
usic:PROCassem
  80CLS:PRINTTAB(0,4);"MUS
IC?":A$=GET$:IFA$="Y":*FX14
,4
  90VDU23,1;0;0;0;0;:PROCi
nstru:ONERRORMODE6:REPORT:P
RINT" at line ";ERL:END
  100PROCtable:lives%=3:sco
re%=0:level%=1
  110PROCmusic:RESTORE:PROC
initmaze:PROCinitvari:PROCi
nitgame
  120key%=(level%*2)+3:L%=L
EN(STR$(score%)):PROCscreen
:PRINTTAB(5,23);"  ";TAB(5,
23);key%;TAB(5,26);lives%;T
AB(13,26);level%;TAB(16-L%,
23);score%:PROCgame
  130DEFPROCassem:DIM Q% 90
0:FORT=0TO2STEP2:P%=Q%:[OPT
T
  140.mainloop:LDX#&C8:LDA#
&81:LDY#&FF:JSR&FFF4:TYA:BN
Epause:JSRghosties:JSRwindo
w:RTS:.pause:LDA#21:LDX#0:J
SR&FFF4:JSR&FFE0:JMPmainloo
p
  150.window:LDX#15:.row:JS
Rstart:CLC:LDA&70:ADC#&90:S
TA&70:LDA&71:ADC#0:STA&71:L
DA&74:CLC:ADC#25:STA&74:LDA
&75:ADC#0:STA&75:DEX:BPLrow
:RTS
  160.start:LDY#10:.fill:ST
Y&8F:LDA(&74),Y:CMP#1:BEQbr
ick:CMP#2:BEQdoor:CMP#3:BEQ
man:CMP#4:BEQghost:CMP#5:BE
Qkey:JMPspace:.ret:LDY&8F:D
EY:BPLfill:RTS
  170.brick:LDA#&A3:STA&72:
LDA#&08:STA&73:JSRpaint:JSR
inc:JMPret:.man:LDA#&C3:STA
&72:LDA#&08:STA&73:JSRpaint
:JSRinc:JMPret:.door:LDA#&B
3:STA&72:LDA#&08:STA&73:JSR
paint:JSRinc:JMPret
  180.ghost:LDA#&D3:STA&72:
LDA#&08:STA&73:JSRpaint:JSR
inc:JMPret:.key:LDA#&E3:STA
&72:LDA#&08:STA&73:JSRpaint
:JSRinc:JMPret:.space:LDY#1
5:.loop2:LDA#0:STA(&70),Y:D
EY:BPLloop2:JSRinc:JMPret
  190.paint:LDY#15:.loop:LD
A(&72),Y:STA(&70),Y:DEY:BPL
loop:RTS:.inc:LDA&70:CLC:AD
C#16:STA&70:LDA&71:ADC#0:ST
A&71:RTS
  200.moveghost:JSR&AF51:LD
A&2A:CMP#200:BCCsmall:JSR&A
F51:LDA&2A:STA&83:.small:LD
Y#0:LDA&82:STA(&80),Y:.fg:L
DA&83:CMP#200:BCCover:JSRup
:.over:CMP#150:BCCover1:JSR
down:.over1:CMP#100:BCCover
2:JSRleft:.over2
  210CMP#50:BCCcheck:JSRrig
ht:.check:LDY#0:LDA(&80),Y:
CMP#0:BEQnegative:CMP#3:BEQ
bri:JSRchangedirec:JSR&AF51
:LDA&2A:STA&83:JMPend2:.bri
```

VARIABLES

keys%	Number of keys left to collect.
loc%	Location holding the start address of the maze segment currently being printed in the window.
man%	Location of man in maze.
X%	X coordinate of man.
Y%	Y coordinate of man.
xmax%	Maximum distance scrolling can continue right.
ymax%	Maximum distance of downwards scrolling.
xmin%	Minimum distance scrolling can continue left.
ymin%	Minimum distance of upwards scrolling.
score%	Score.
level%	Level reached.
lives%	Number of lives left.

PROCEDURES

assemble	Pokes in machine code.
up	Moves man up and scrolls.
down	Moves man down and scrolls.
left	Moves man left and scrolls.
right	Moves man right and scrolls.
key	Updates the number of keys left and increases score.
screen	Sets up the screen display.
dead	Lose a life. All gone? Hiscore?
table	Prints high score table.
initmaze	Pokes in the maze.
initvari	Initialises variables.
initgame	Sets up memory locations used.
game	Calls the machine code and updates your man until you are dead.
input	Name input routine (uses Osword with A=0).
welldone	Congratulations and increment level.

ARRAYS

nm$( )	Holds top 10 names.
hi%( )	Holds top 10 scores.

The Break key definition is corrupted because I have used the page of memory allocated to the function key definitions. Press Escape after Break or Ctrl + Break at the same time then OLD (Return), to enable normal editing. Type in the data carefully otherwise you may have an impossible game.

Get Set Santa listing

```
:LDA#1:STA&7E:RTS
  220.negative:LDY#0:LDA(&80),Y:.finish:STA&82:.end2:LDA#4:LDY#0:STA(&80),Y:RTS
  230.changedirec:LDA&83:CMP#200:BCSdown:CMP#150:BCSup:CMP#100:BCSright:CMP#50:BCSleft:JSR&AF51:LDA&2A:STA&83:RTS:.up:SEC:LDA&80:SBC#25:STA&80:LDA&81:SBC#0:STA&81:RTS
  240.down:CLC:LDA&80:ADC#25:STA&80:LDA&81:ADC#0:STA&81:RTS:.right:CLC:LDA&80:ADC#1:STA&80:LDA&81:ADC#0:STA&81:RTS:.left:SEC:LDA&80:SBC#1:STA&80:LDA&81:SBC#0:STA&81:RTS
  250.ghosties:LDA&84:STA&80:LDA&85:STA&81:LDA&86:STA&82:LDA&87:STA&83:JSRmoveghost:LDA&80:STA&84:LDA&81:STA&85:LDA&82:STA&86:LDA&83:STA&87
  260LDA&88:STA&80:LDA&89:STA&81:LDA&8A:STA&82:LDA&8B:STA&83:JSRmoveghost:LDA&80:STA&88:LDA&81:STA&89:LDA&82:STA&8A:LDA&83:STA&8B
  270LDA&8C:STA&80:LDA&8D:STA&81:LDA&8E:STA&82:LDA&8F:STA&83:JSRmoveghost:LDA&80:STA&8C:LDA&81:STA&8D:LDA&82:STA&8E:LDA&83:STA&8F
  280LDA&76:STA&80:LDA&77:STA&81:LDA&78:STA&82:LDA&79:STA&83:JSRmoveghost:LDA&80:STA&76:LDA&81:STA&77:LDA&82:STA&7B:LDA&83:STA&79
  290LDA&7A:STA&80:LDA&7B:STA&81:LDA&7C:STA&82:LDA&7D:STA&83:JSRmoveghost:LDA&80:STA&7A:LDA&81:STA&7B:LDA&82:STA&7C:LDA&83:STA&7D:RTS
  300.music:PHP:PHA:TXA:PHA:TYA:PHA:LDA#&80:LDX#&FA:LDY#&FF:JSR&FFF4:CPX#10:BMInospace:LDY&B0:LDAdata,Y:STAsound+4:DEY:LDAdata,Y:STAsound+6:LDA#7:LDX#sound MOD256:LDY#sound DIV256:JSR&FFF1:DEC&B0:DEC&B0:BNEnospace:LDA#182:STA&B0
  310.nospace:PLA:TAY:PLA:TAX:PLA:PLP:RTS:.sound:EQUD&00000000:EQUD&00000000
  320RTS:]:NEXT:!sound=1:sound!2=-15:?&220=music MOD256:?&221=music DIV256:OSCLI"FX13,4":OSCLI"FX14,0":?&B0=182:ENDPROC
  330DEFPROCmusic:DIM data 182:RESTORE950:FORT%=182TO1STEP-1:READJ%:T%?data=J%:NEXT:ENDPROC
  340DEFPROCinitmaze:FORT%=0TO674:READD%:T%?&900=D%:NEXT:FORT%=&8A3TO&BF2:READD$:D%=EVAL("&"+D$):?T%=D%:NEXT:ENDPROC
  350DEFPROCinitvari:locI%=&907:manI%=&925:X%=13:Y%=2:xmaxI%=19:xminI%=7:ymaxI%=12:yminI%=3:ENDPROC
  360DEFPROCinitgame:?&70=&C0:?&71=&5A:?&74=locI% MOD 256:?&75=locI% DIV 256
  370FORT=0TO12STEP4:posI=&
```

Get Set Santa listing

From Page 23

```
920+(RND(650)):T?&84=posX MOD 256:T?&85=posX DIV 256:T?&86=?posX:T?&87=RND(255):NEXT
  380?&76=&E5:?&77=&09:?&78=0:?&79=RND(255):?&7A=&D0:?&7B=&09:?&7C=1:?&7D=RND(255):?&7E=0:ENDPROC
  390DEFPROCgame:REPEAT:CALL&FFF4:IF?&7E=1:PROCdead
  400IFINKEY-98:PROCleft:GOTO440
  410IFINKEY-67:PROCright:GOTO440
  420IFINKEY-73:PROCup:GOTO440
  430IFINKEY-105:PROCdown
  440?&74=locX MOD 256:?&75=locX DIV 256:?&70=&C0:?&71=&5A:?manX=3:UNTIL FALSE
  450DEFPROCleft:IF?(manX+1)=1:ENDPROC
  460IF?(manX+1)=5:PROCkey
  470IF?(manX+1)=4:PROCdead
  480IFXX<xminX:?manX=0:manX=manX+1:XX=XX-1:xminX=xminX-1:xmaxX=xmaxX-1:ENDPROC
  490?manX=0:manX=manX+1:locX=locX+1:XX=XX-1:ENDPROC
  500DEFPROCright:IF?(manX-1)=1:ENDPROC
  510IF?(manX-1)=5:PROCkey
  520IF?(manX-1)=4:PROCdead
  530IFXX>xmaxX:?manX=0:manX=manX-1:XX=XX+1:xmaxX=xmaxX+1:xminX=xminX+1:ENDPROC
  540?manX=0:manX=manX-1:locX=locX-1:XX=XX+1:ENDPROC
  550DEFPROCup:IF?(manX-25)=1:ENDPROC
  560IF?(manX-25)=5:PROCkey
  570IF?(manX-25)=4:PROCdead
  580IFYX<yminX:?manX=0:manX=manX-25:YX=YX-1:yminX=yminX-1:ymaxX=ymaxX-1:ENDPROC
  590?manX=0:manX=manX-25:locX=locX-25:YX=YX-1:ENDPROC
  600DEFPROCdown:IF?(manX+25)=1:ENDPROC
  610IF?(manX+25)=5:PROCkey
  620IF?(manX+25)=4:PROCdead
  630IFYX>ymaxX:?manX=0:manX=manX+25:yminX=yminX+1:ymaxX=ymaxX+1:YX=YX+1:ENDPROC
  640?manX=0:manX=manX+25:locX=locX+25:YX=YX+1:ENDPROC
  650DEFPROCscreen:COLOUR129:CLS:PRINTTAB(3,2);"GET SET SANTA";TAB(3,22);"GIFTS";SPC(3);"SCORE";TAB(5,23);"0";SPC(5);"00000";TAB(3,25)"LIVES";SPC(3);"LEVEL";TAB(5,26);"3";SPC(7)"0";TAB(5,28);"BY  STEVO"
  660FORT=1TOkeyX
  670posX=RND(674):IFposX?&900()0:GOTO670
  680posX?&900=5:NEXT
  690ENDPROC
  700DEFPROCkey:keyX=keyX-1:scoreX=scoreX+50:IFkeyX=0:PROCwelldone:levelX=levelX+1:GOTO110
  710LX=LEN(STR$(scoreX)):PRINTTAB(5,23);SPC(2);TAB(5,23);keyX;TAB(16-LX,23);scoreX:ENDPROC
  720DEFPROCdead:?&74=locX MOD 256:?&75=locX DIV 256:?&70=&C0:?&71=&5A:?manX=4:CALLwindow:livesX=livesX-1:IFlivesX=0:GOTO740
  730?&7E=0:GOTO110
  740PRINTTAB(4,8);SPC(11);TAB(4,9);" GAME OVER ";TAB(4,10);SPC(11):FORT=1TO8000:NEXT:IFscoreX>hiX(10):PROCinput:*FX21,0
  750GOTO100
  760DEFPROCinstru:CLS:COLOUR2:PROCaess("GET SET SANTA",3,2):COLOUR1:PROCaess("I - LEFT",4,7):PROCaess("I - RIGHT",4,9):PROCaess("+ - UP",4,11):PROCaess("/ - DOWN",4,13):PROCaess("P - PAUSE",4,16):COLOUR2
  770PROCaess("ANY KEY TO START",2,25):G=GET:ENDPROC
  780DEFPROCaess(A$,XCX,YCX):LOCALXX,YX,PX,IX:XX=XCX:YX=YCX:IX=XX+LENA$:FORT=1TOLENA$:XX=XX+1:F$=MID$(A$,T,1):FORPX=IXTOXXSTEP-1:PRINTTAB(PX,YX);F$:NEXT:NEXT:ENDPROC
  790DEFPROCtable:COLOUR128:CLS:COLOUR3:PRINTTAB(4,3);"GIFT GETTERS":COLOUR1:PRINT''':FORT=1TO9:PRINTTAB(2);T;". ";na$(T);TAB(14);hiX(T):PRINT:NEXT:PRINTTAB(1);"10. ";na$(10);TAB(14);hiX(10):COLOUR3:PRINTTAB(2,30);"ANY KEY TO START"
  800A=GET:*FX21,0
  810ENDPROC
  820DEFPROCinput:CLS:COLOUR3:PROCaess("A MERRY",5,24):PROCaess("CHRISTMAS",4,26):PROCaess("FROM ELECTRON USER",0,28):PRINTTAB(3,2)"TOP TEN SCORE";TAB(2,9)"ENTER YOUR NAME";TAB(5,17)"-----";TAB(5,17);:VDU23,1,1;0;0;0;0;:*FX21,0
  830XX=&80:YX=&A:AX=0:!&A80=&A00:?&A82=0:?&A83=32:?&A84=128:CALL&FFF1:N$=$&A00:VDU23,1;0;0;0;0;
  840sX=0:REPEAT:sX=sX+1:UNTIL scoreX>hiX(sX):FORpX=9TOsXSTEP-1:hiX(pX+1)=hiX(pX):na$(pX+1)=na$(pX):NEXT:hiX(sX)=scoreX:na$(sX)=N$:ENDPROC
  850DEFPROCwelldone:CLS:COLOUR3:PRINTTAB(1,10)"LEVEL ";levelX;" COMPLETED";TAB(5,17)"ENTERING";TAB(4,19)"NEXT STAGE":FORY=1TO1000:NEXT:ENDPROC
  860DATA1,1,1,
```

PLUS 1

The key to joystick control of your programs

By NIGEL PETERS

ARE you the proud owner of a Plus 1? If you are then read on. If you aren't go and get yourself one – it's a superb piece of kit and you'll need it to follow this article.

You'll also need a set of joysticks because this month we'll be looking at how to use joysticks in your own programs.

Do you remember the alien programs in the Program Probe feature in the September 1984 and April 1985 issues of *Electron User*.

In the earlier article we used a short program from Ian Rodgers to illustrate how we could control an object's screen movement courtesy of the cursor keys.

The later article used the same program as the basis for one illustrating collision detection. Program I shows the result.

This month we'll be adding yet more code to the program allowing the alien to be guided by joystick rather than by cursor keys.

The reason you need the Plus 1 is that the Electron by itself won't support the use of joysticks. You have to have an interface to allow your joysticks to speak to the micro.

The Plus 1 comes with, among other goodies, an analogue interface.

You needn't worry too much about what exactly an analogue interface is. For the purposes of this article it's the thing that you plug your analogue joysticks into!

Notice that you use *analogue* joysticks with the Plus 1. Some other interfaces, such as the ones from Power or First Byte, use switched or Atari-style joysticks.

These won't work with the Plus 1, and vice versa, so make sure that you get the correct joystick for your interface.

When you've got your joystick plugged into the analogue port of the Plus 1 the joystick can now "talk" or send signals to the Electron.

And, like everything else inside the computer, it does it using numbers.

It doesn't say "up", it sends a number that stands for "go up". The program must be able to read this number and do the appropriate movement.

You're not just stuck with one line of communication. The analogue port allows whatever is attached to it to send messages along four different channels should it want to.

It looks at each of these analogue channels in turn, taking information from them and passing it to the Electron in numeric form.

These numbers, which we'll see in a moment, range from 0 to 65280, the values going up in steps of 256 at a time.

Each channel returns a value and the value returned depends on the position of the joystick at the moment that the Electron looks at, or accesses, that channel.

Now if the numbers vary according to what the joystick is doing, then it's probably occurred to you that if we could get at these numbers from our programs we could use them to control the little alien from Program I.

He could change his position on the screen, his movement depending on what value was returned from a particular channel.

Program II shows how we can use the ADVAL command in Basic programs to read values from the analogue port.

ADVAL(n) returns the value on channel *n* of the analogue port.

The number *n* varies from 1 to 4 according to which channel you want to look at. Before you run the program, make sure that you've got your joystick plugged in.

At first all you get is a series of boring numbers, but as you wiggle your joystick about you'll see that these numbers change.

In fact they're varying

```
  10 REM PROGRAM I
  20 REM COLLISION DETECTI
ON
  30 REM BASED ON A PROGRA
M BY IAN RODGERS
  40 REM use cursor keys
  50 MODE1
  60 VDU23,1,0;0;0;0;
  70 VDU23,224,24,60,126,2
19,126,36,66,129
  80 X=0
  90 Y=0
 100 PROCobstacle
 110 COLOUR 128
 120 REPEAT
 130 PROCgame
 140 UNTIL check=2
 150 PROCbang
 160 REPEAT UNTIL FALSE
 170 DEFPROCbang
 180 CLS
 190 SOUND 0,-15,6,40
 200 PRINT TAB(20,15)"BANG"
 210 ENDPROC
 220 DEFPROCobstacle
 230 VDU 24,416;800;608;99
2;
 240 GCOL 0,130:CLG
 250 ENDPROC
 260 DEFPROCgame
 270 check=POINT'(X*32+16)
,(1023-Y*32-16))
 280 IF check<>2 THEN PRIN
TTAB(X,Y)CHR$224
 290 FOR delay=1 TO 100:NE
XT
 300 IF INKEY(-122) THEN X
=X+1:PRINTTAB(X-1,Y)" ":IF
X=39 THEN X=38
 310 IF INKEY(-26) THEN X=
X-1:PRINTTAB(X+1,Y)" ":IF X
=-1 THEN X=0
 320 IF INKEY(-42) THEN Y=
Y+1:PRINTTAB(X,Y-1)" ":IF Y
=31 THEN Y=30
 330 IF INKEY(-58) THEN Y=
Y-1:PRINTTAB(X,Y+1)" ":IF Y
=-1 THEN Y=0
 340 SOUND 1,-15,X,1
 350 SOUND 1,-15,32-Y,1
 360 ENDPROC
```

Program I

```
  10 REM PROGRAM II
  20 MODE 0
  30 VDU 23,1,0;0;0;0;
  40 PRINT "Mess about wit
h your joysticks!"
  50 REPEAT
  60 PRINT TAB(5,8)"ADVAL(
1)"TAB(15,8)"ADVAL(2)"TAB(2
5,8)"ADVAL(3)"TAB(35,8)"ADV
AL(4)"
  70 PRINT TAB(0,10) ADVAL
(1),ADVAL(2),ADVAL(3),ADVAL
(4)
  80 UNTIL FALSE
```

Program II

From Page 25

according to the position of the joystick.

Exactly which channel is affected by which joystick movement depends on the joystick you're using. We'll come to that in a moment.

First, however, we'll do something to make the values returned from an ADVAL() more manageable.

You'll remember that I said earlier that the values returned from the channels go up in steps of 256.

I don't know about you, but I find these large numbers rather confusing, so I use DIV 256 to cut them down to size.

I haven't lost any information, just cut the figures down to a more manageable size. Program III shows this in practice:

```
  10 REM PROGRAM III
  20 MODE 0
  30 VDU 23,1,0;0;0;0;
  40 PRINT "Notice where t
he 0s and 255s occur"
  50 REPEAT
  60 PRINT TAB(5,8)"ADVAL(
1)"TAB(15,8)"ADVAL(2)"TAB(2
5,8)"ADVAL(3)"TAB(35,8)"ADV
AL(4)"
  70 PRINT TAB(0,10) ADVAL
(1) DIV 256,ADVAL(2) DIV 25
6,ADVAL(3) DIV 256,ADVAL(4)
 DIV 256
  80 UNTIL FALSE
```

Program III

Now when you wiggle the joystick about you should notice that when the joystick is in its extreme positions of left and right, up and down, the values returned by ADVAL() are 0 and 255.

Again, which position returns which value on which channel depends on your joysticks. Experiment and see.

I use a Voltmace joystick, one of the best around. With this when I run Program III channel 1 returns a value of 0 when the joystick is furthest to the right and 255 when it's at the left.

Channel 2 gives the value of 255 when the stick is furthest forward and 0 when it's furthest back.

A little thought shows that these numbers can be used to control the little man. A 0 on channel 1 means he is to go right, a 255 that he's to go left. Similarly a 255 on channel 2 would have him going upwards, a 0 sending him down.

Program IV spells out what each of the joystick positions does.

```
  10 REM PROGRAM IV
  20 REPEAT
  30 IF ADVAL(1) DIV 256=0
 THEN PRINT "Right"
  40 IF ADVAL(1) DIV 256=2
55 THEN PRINT"Left"
  50 IF ADVAL(2) DIV 256=2
55 THEN PRINT"Up"
  60 IF ADVAL(2) DIV 256=0
 THEN PRINT"Down"
  70 UNTIL FALSE
```

Program IV

Remember, your joysticks may be slightly different. Perhaps right will be a 255 on channel 2 while left would be a 0 on the same channel. Experiment and see.

In case you're wondering what's happened to channels 3 and 4, the answer is that they're not needed with a single joystick.

They are used to take information from a second joystick. Here, however, we're sticking to just one.

So now that we know what values are returned for the up, down, left and right positions of the joystick, we can use them in our alien program. Program V shows how it's done.

The main difference is that there are three new procedures.

PROCask is fairly straightforward. It just asks if you want to use keys or joysticks to control the little man.

Notice how it's mugtrapped to allow only J, j, K or k as inputs.

If the answer is K or k then the logical variable *key* is set to TRUE and PROCgame will call PROCkey.

If you've read the previous articles then PROCkey should cause you no problems. It's just our old method of using the cursor keys to control the alien's movement. Now the code is put into a procedure instead of being part of PROCgame as it was in Program I.

It's PROCjoy, as you might expect, that uses the joystick to control the little man. It's not hard to figure out how it works.

Compare the four lines 380 to 410 with the lines 440 to 470 and you'll see how ADVAL() replaces INKEY() in deciding which way the man goes.

With keys the man goes right if the right cursor key is pressed, giving INKEY(-122) as true.

With joystick control the man moves right when the joystick is furthest right, returning 0 from ADVAL(1) DIV 256.

Similarly ADVAL(n) DIV 256 takes the place of INKEY() with the other three directions.

So as you can see, using joysticks with the Plus 1 is quite simple, provided you check out which joystick direction gives which ADVAL() value.

Your joysticks may not be the same as mine. My up might be your down, with disastrous results.

And that's where we'll leave it for this time, although don't be surprised if there's another sighting of aliens, joysticks and the Plus 1 in the near future.

```
  10 REM PROGRAM V
  20 REM JOYSTICK CONTROL
  30 REM BY NIGEL PETERS
  40 REM BASED ON A PROGRA
M BY IAN RODGERS
  50 REM use cursor keys
  60 REM or joystick
  70 MODE1
  80 VDU23,1,0;0;0;0;
  90 VDU23,224,24,60,126,2
19,126,36,66,129
 100 X=0
 110 Y=0
 120 key=FALSE
 130 PROCask
 140 PROCobstacle
 150 COLOUR 128
 160 REPEAT
 170 PROCgame
 180 UNTIL check=2
 190 PROCbang
 200 REPEAT UNTIL FALSE
 210 DEFPROCbang
 220 CLS
 230 SOUND 0,-15,6,40
 240 PRINT TAB(20,15)"BANG
"
 250 ENDPROC
 260 DEFPROCobstacle
 270 VDU 24,416;800;608;99
2;
 280 GCOL 0,130:CLG
 290 ENDPROC
 300 DEFPROCgame
 310 check=POINT((X*32+16)
,(1023-Y*32-16))
 320 IF check<>2 THEN PRIN
TTAB(X,Y)CHR$224
 330 IF key=TRUE THEN PROC
key ELSE PROCjoy
 340 SOUND 1,-15,X,1
 350 SOUND 1,-15,32-Y,1
 360 ENDPROC
 370 DEF PROCjoy
 380 IF ADVAL(1) DIV 256=0
 THEN X=X+1:PRINTTAB(X-1,Y)
" ":IF X=39 THEN X=38
 390 IF ADVAL(1) DIV 256=2
55 THEN X=X-1:PRINTTAB(X+1,
Y)" ":IF X=-1 THEN X=0
 400 IF ADVAL(2) DIV 256=2
55 THEN Y=Y-1:PRINTTAB(X,Y+
1)" ":IF Y=-1 THEN Y=0
 410 IF ADVAL(2) DIV 256=0
 THEN Y=Y+1:PRINTTAB(X,Y-1)
" ":IF Y=31 THEN Y=30
 420 ENDPROC
 430 DEF PROCkey
 440 IF INKEY(-122) THEN X
=X+1:PRINTTAB(X-1,Y)" ":IF
X=39 THEN X=38
 450 IF INKEY(-26) THEN X=
X-1:PRINTTAB(X+1,Y)" ":IF X
=-1 THEN X=0
 460 IF INKEY(-42) THEN Y=
Y+1:PRINTTAB(X,Y-1)" ":IF Y
=31 THEN Y=30
 470 IF INKEY(-58) THEN Y=
Y-1:PRINTTAB(X,Y+1)" ":IF Y
=-1 THEN Y=0
 480 ENDPROC
 490 DEF PROCask
 500 INPUT "Do you want to
 use keys or joystick? K/J
" answer$
 510 IF INSTR("JjKk",answe
r$)=0 THEN GOTO 500
 520 IF answer$="K" OR ans
wer$="k" THEN key=TRUE
 530 CLS
 540 ENDPROC
```

Program V

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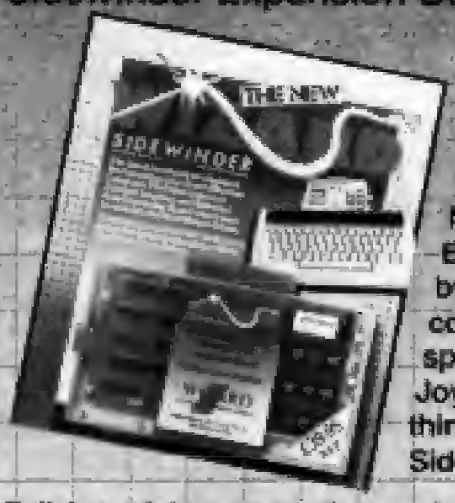

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Let's round up the livestock with a few LEFT$, RIGHT$ and MID$

LAST month we learnt about the Basic functions LEFT$ and RIGHT$. They were used to take specified numbers of characters from the left and right ends of strings respectively.

We also saw how they could be used to extract information held in the fields of a data string, but found they had limitations.

Have a look at the animal data held in Figure I and you'll see what I mean.

NAME	SPECIES	AGE	WEIGHT
TOM	CAT	3	7
IAN	RAT	2	1
ERIC	BAT	1	1

Figure I: Animal data

If we try holding all the information about Tom the cat, Ian the rat and Eric the bat in three data strings we run into trouble when we want just part of the data, not all of it.

Take a look at Program I, which uses LEFT$ to extract the name and species of the animals held in the data statements.

By now you should have no difficulty in figuring out how the program works.

It stores the three data strings in the array *record$*. It then uses LEFT$ to extract the necessary information from the relevant array element each time round the loop.

```
   10 REM PROGRAM I
   20 DIM record$(3)
   30 FOR loop=1 TO 3
   40 READ record$(loop)
   50 NEXT loop
   60 FOR loop=1 TO 3
   70 PRINT LEFT$(record$(l
oop),8)
   80 NEXT loop
   90 DATA " TOM CAT 3 7"
  100 DATA " IAN RAT 2 1"
  110 DATA "ERIC BAT 1 1"
```

Program I

Try modifying the program to get the species, age and weight. You should have no trouble if you use RIGHT$.

However you will have trouble trying to get just a name and age or a species and weight using LEFT$ and RIGHT$. Try it and see.

The problem arises because of the way the data is stored in the data strings.

Each string holds four pieces of information, each piece of information held in one of four fields.

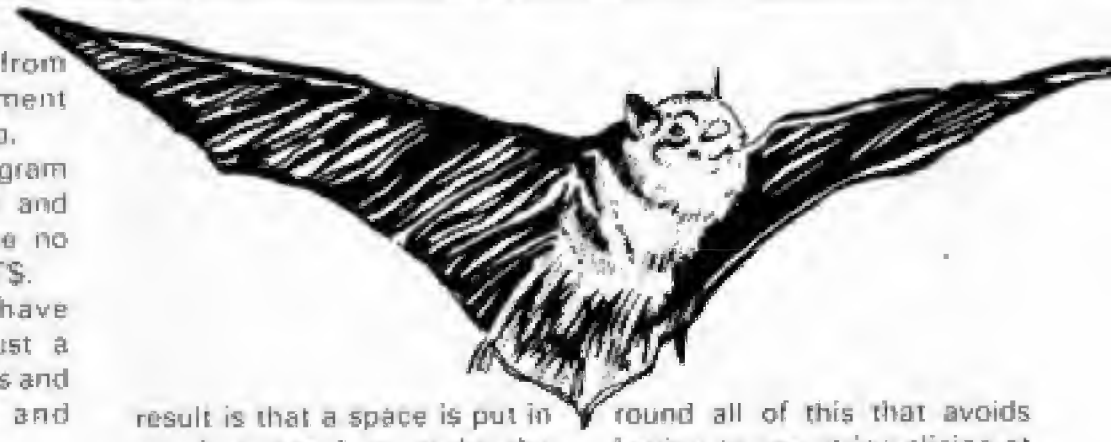
Each of these fields is made up of a fixed number of characters, the whole data string consisting of 12 characters.

The first four characters are set aside for the animal's name, then a space, then three characters for the species, a space, the age, another space and then the weight. Figure II shows this in detail.

Strictly speaking we don't need the spaces between the fields, they're just there to make it more legible.

However we do need them to pad out a field if the information in it doesn't fill all the allocated spaces. In this case the name fields are four characters long.

However Ian and Tom are only three letters apiece. The result is that a space is put in as character 1 to make the field the required length.



Using this method and LEFT$ and RIGHT$ it's easy to break off one or more fields from either end of a data string. But you can't get at the middle ones by themselves. You have to include the information at either end.

LEFT$ and RIGHT$ are useful functions, but they're a bit clumsy. They'll take a specified number of characters from each end of a string but not from the middle.

And when we've got several bits of information in a string, often it's only the middle bits we want.

Of course there is a way round all of this that avoids having to use string slicing at all. We can just store all the information we want in a number of arrays. Then we can pick and choose between arrays as necessary. Program II shows how it's done.

As you can see it works, giving us the species and weight for each of the animals, something we were unable to do before.

Try adjusting line 70 so it gives you the name and age of the animals. It's quite a flexible program.

The trouble is that it uses four arrays. In this case it's all right, but in practical applications using lots of records containing lots of different

Character position	1	2	3	4	5	6	7	8	9	10	11	12
Data	E	R	1	C		B	A	T		1		1
		I	A	N		R	A	T		2		1
		T	O	M		C	A	T		3		7

Figure II: Character positions of record$()

```
   10 REM PROGRAM II
   20 DIM name$(3),specie$(
3),age(3),weight(3)
   30 FOR loop=1 TO 3
   40 READ name$(loop),spec
ie$(loop),age(loop),weight(
loop)
   50 NEXT loop
   60 FOR loop=1 TO 3
   70 PRINT name$(loop)" th
e "specie$(loop)" weighs ";
weight(loop)" pound."
   80 NEXT loop
   90 DATA TOM,CAT,3,7
  100 DATA IAN,RAT,2,1
  110 DATA ERIC,BAT,1,1
```

Program II

pieces of information, these arrays grow and grow.

So memory becomes limited and the method impractical.

Now our previous method of storing information in the fields of a data string is very efficient in its use of memory, but not so flexible.

Wouldn't it be nice if there were a Basic command that allowed you to pick a number of characters from anywhere in a string, rather than having to start at either end as we had to with LEFT$ and RIGHT$?

In fact, we can do just that using the function MID$. To see how it works, enter:

```
PRINT MID$("anystrings"
,4,6)
```

and you'll be rewarded with:

```
string
```

What's happened is that the MID$ function has sliced off part of the string that you've given it in the brackets. The numbers following this string tell the micro where to start the slicing and how many characters it is to slice off.

In this case the string is *anystrings*. The figure 4 tells the Electron to start slicing at the fourth character from the left, in this case an s.

The final figure tells it how many characters to take. Here it's 6, so we end up with:

```
string
```

Try doing that with LEFT$ or RIGHT$! As you can see, MID$ allows us to take a number of characters from the middle of a string.

It's just what we need to get at the fields locked in the middle of a data string. Before we go on to that however, try playing around with MID$ until you feel you understand it well.

Can you explain why:

```
PRINT MID$("anystrings"
,2,5)
```

produces:

```
nystr
```

as its result?

You can use variables inside MID$. Enter:

```
string$="balloon"
beginning=2
length=3
PRINT MID$(string$,
beginning,length)
```

and you'll see that it's the same as:

```
PRINT MID$("balloon",2,3),
```

What happens if you ask MID$ to give you more characters than there are left in the string? Try it and see.

```
PRINT MID$("pqrst",3,7)
```

seems to be asking for seven characters from *"pqrst"*, starting at the letter r. The trouble is that, including the r, there are only three characters left in the string.

As you'll have seen if you typed it in, the Electron just gives you as many letters as there are remaining in the string and leaves it at that.

What happens if you leave out the last number? What will you get if you enter:

```
PRINT MID$("abcde",2)
```

You've told the Electron you want to take some characters from *"abcde"*. You've also told it where to start, at the second character, the letter b.

What you haven't said is how many you want. In this case, as before, the Electron just assumes that you want the rest of the string and gives you:

```
bcde
```

for your pains.

So, now we've got three ways of slicing strings. Without using your Electron, can you predict what the results of entering:

```
PRINT MID$("1234",2)
PRINT LEFT$("1234,2)
PRINT RIGHT$("1234",2)
```

will be? And can you explain the differing output?

As we saw before, we can use variables inside the brackets of a MID$. This can be very useful and gives us a very powerful method of slicing strings. Program III shows this in action.

Here the FOR ... NEXT loop cycles seven times. Each time round the loop the MID$

```
   10 REM PROGRAM III
   20 whole$="abcdefg"
   30 FOR start=1 TO 7
   40 PRINT MID$(whole$,sta
rt,1)
   50 NEXT start
```

Program III

operates on *whole$*, taking one character from it.

Which character is taken depends on the value of the loop control variable *start*. Try altering the program so that it takes two or three letters at a time.

```
   10 REM PROGRAM IV
   20 whole$="abcdefg"
   30 FOR slice=1 TO 7
   40 PRINT MID$(whole$,1,s
lice)
   50 NEXT slice
```

Program IV

In contrast, Program IV uses MID$ to take progressively larger numbers of letters from *whole$*.

As the loop control variable slice increases in value, so more characters are taken from *whole$*. However the slicing always starts from the first character. The result is:

```
a
ab
abc
abcd
abcde
abcdef
abcdefg
```

Now doesn't this remind you of something? Can you use the same program to produce such a triangle of asterisks? All you have to do is to change line 20 to:

```
20 whole$="********"
```

and you have one. Use a decreasing STEP to produce a decreasing triangle.

But what of the reverse images of the above triangles?

```
   10 REM PROGRAM V
   20 asterisk$="********"
   30 length=LEN(asterisk$)
   40 FOR loop=1 TO 8
   50 line$=STRING$(length-
loop,CHR$(32))+MID$(asteris
k$,1,loop)
   60 PRINT line$
   70 NEXT loop
```

Program V

Program V makes use of MID$

From Page 29

and STRING$ to produce one of them.

The heart of the program lies in line 50. This takes a number of spaces and a number of asterisks and joins them into one string *line$*. This is then printed out by the next line.

Each time round the loop there is one less space and one more asterisk. The result is:

```
        *
       **
      ***
     ****
    *****
   ******
  *******
 ********
```

Can you alter the program to produce:

```
 ********
  *******
   ******
    *****
     ****
      ***
       **
        *
```

Tearing ourselves away from triangles of asterisks, let's have a look at Program VI. If you find the output rushes past too quickly, use the Ctrl and Shift keys to hold things up.

```
10 REM PROGRAM VI
20 whole$="abcdefg"
30 FOR start=1 TO 7
40 FOR slice=1 TO 7
50 PRINT MID$(whole$,sta
rt,slice)
60 NEXT slice
70 NEXT start
```

Program VI

This listing is a combination of Programs III and IV. Now the MID$ lies at the heart of a pair of nested FOR ... NEXT loops.

Notice that the control variables of these loops, *start* and *slice* are both used in the MID$.

As you can see from Program VI's output, MID$ is a very powerful function, especially when used with loops.

So let's see how we can use it to solve our original problem.

Program VII, though a little inflexible, gives us what we want, allowing us access to any of the fields in *record$()*.

```
10 REM PROGRAM VII
20 DIM record$(3)
30 FOR loop=1 TO 3
40 READ record$(loop)
50 NEXT loop
60 FOR loop=1 TO 3
70 PRINT MID$(record$(lo
op),6,3);"  "MID$(record$(l
oop),12,1)
80 NEXT loop
90 DATA " TOM CAT 3 7"
100 DATA " IAN RAT 2 1"
110 DATA "ERIC BAT 1 1"
```

Program VII

Line 70 is the one to understand. The first MID$ takes three characters, beginning at the sixth character in. This is the species field.

The second MID$ takes one character, starting at the twelfth position. This is the weight field.

When the final loop has finished, the program displays:

```
CAT  7
RAT  1
BAT  1
```

the species and weight fields we were unable to get at, or access, before. Changing line 70 to:

```
70 PRINT MID$(record$
(loop),1,4);"  "MID$
(record$(loop),10,1)
```

gives us:

```
TOM  3
IAN  2
ERIC  1
```

"But what if it were Eric the ardvaak or Tom the tarantula?"

However while Program VII may show how MID$ solves our previous problems, it's still a bit inflexible.

If I want to display a different combination of fields from a data string, a program line has to be changed.

Surely it would be better if the program had the Electron asking me which combination of fields I want to see? Program VIII does this.

I leave this to you to figure out as your "homework". Don't worry though, there's nothing in it that we haven't covered already.

It's just a bit longer than our normal examples, and so looks more formidable. However, if you take it step by step, you should have no problems.

And when you've done that, can you improve it? I'm not too happy with the inputs. Could they be better mugtrapped?

And could our method of storing information in a data string be made more efficient? After all, we're wasting spaces in the name fields.

And what if our animals didn't all belong to convenient three letter species? What if it were Eric the aardvark or Tom the tarantula?

● *We'll meet the answers to some of these questions next time as we look inside strings with INSTR.*

```
10 REM PROGRAM VIII
20 REM ****************
30 DIM record$(3)
40 FOR loop=1 TO 3
50 READ record$(loop)
60 NEXT loop
70 REM ****************
80 INPUT "Do you want na
mes? Y/N " test$
90 IF test$="Y" OR test$
="y" THEN name=TRUE ELSE na
me=FALSE
100 INPUT "Do you want sp
ecies? Y/N " test$
110 IF test$="Y" OR test$
="y" THEN species=TRUE ELSE
 species=FALSE
120 INPUT "Do you want ag
e? Y/N " test$
130 IF test$="Y" OR test$
="y" THEN age=TRUE  ELSE ag
e=FALSE
140 INPUT "Do you want we
ight? Y/N " test$
150 IF test$="Y" OR test$
="y" THEN weight=TRUE ELSE
weight=FALSE
160 PRINT
170 REM ****************
180 FOR loop=1 TO 3
190 IF name THEN PRINT MI
D$(record$(loop),1,4)"  ";
200 IF species THEN PRINT
 MID$(record$(loop),6,3)"
";
210 IF age THEN PRINT MID
$(record$(loop),10,1)"  ";
220 IF weight THEN PRINT
MID$(record$(loop),12,1)"
";
230 PRINT:PRINT
240 NEXT loop
250 REM ****************
260 DATA " TOM CAT 3 7"
270 DATA " IAN RAT 2 1"
280 DATA "ERIC BAT 1 1"
```

Program VIII

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The A/D/USER PORT interface box. This gives simultaneous access to both the analogue port, for the joystick part and the user port, for the keypad. Two handsets can be plugged into the box giving a total of 24 user definable keys.
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SPACE COUNT

By
STEVE
LUCAS

SPACE Count is a simple educational game aimed at five to seven year olds.

When the program is run a number of coloured objects will be displayed on the screen and the aim is to count them.

To make life a little more exciting the counting must be done before Cedric flies his plane across the bottom of the screen.

Each correct answer makes Cedric fly his plane faster, making the next question more difficult.

If very young children are playing you may want to remove this by deleting the end of line 1290.

Each wrong answer makes Cedric slow down for the next question.

Two attempts are given for each question and the child has three lives in each game.

The game was written for the Electron. If it is run on the BBC Micro Cedric will fly across the screen far too fast and you should make the changes suggested in line 130.

PROCEDURES

setup	Chooses random numbers and stores this in the array.
game	Main control loop.
highscore	Deals with end of game.
top	Defines top window.
middle	Defines middle window.
bottom	Defines bottom window.
tries	Allows you to answer the question.
get	Tests the keyboard input.
win	Correct answer.
close	Wrong answer.
error	Error handling.
move	Move plane.

MAIN VARIABLES

S%	Score.
lives%	Number of lives.
U%	Position of plane.
col%	Colour.
V%	Random number.
X%,Y%	General variables.
gra$	Graphics.
A$	Keyboard input.
B$	String value of answer.
ans%	Correct answer.
col$(X)	Words for the numbers.
val%(x,y)	Array to hold positions for screen locations.
speed%	Speed of game.
try%	Attempt.
guess%	Answer selected.

Full listing starts on Page 34

Space Count listing

From Page 33

```
   10 REM ** Space Count **
   20 REM ** an educational
 program for 5-6 year olds
**
   30 REM ** by Steve Lucas
 **
   35 REM (c) Electron User
   40 ON ERROR MODE6:PROCer
ror
   50 MODE6:VDU19,0,4,0,0,0
   60 *FX210,0
   70 PRINTTAB(14,2)"Space
Count"''"SPC2"by Steve M. Lu
cas for Electron User"
   80 REM ** sound on or of
f **
   90 PRINTTAB(6,10)"Do you
 want sound (Y/N) ?";
  100 REPEAT:A$=GET$:UNTIL
INSTR("YyNn",A$):IFA$="N"OR
A$="n"THEN*FX210,1
  110 REM ** set variables
**
  120 lives%=3:DIM col$(40)
,val%(10,4):FOR X=0 TO 40:R
EADcol$(X):NEXT X:speed%=30
:U%=0:S%=0
  130 REM **change the valu
e of speed% to 100 in line
120 on the BBC micro **
  140 DATA zero,one,two,thr
ee,four,five,six,seven,eigh
t,nine,ten,eleven,twelve,th
irteen,fourteen,fifteen,six
teen,seventeen,eighteen,nin
eteen,twenty
  150 DATA twenty one,twent
y two, twenty three, twenty
 four,twenty five,twenty si
x,twenty seven,twenty eight
,twenty nine
  160 DATA thirty,thirty on
e,thirty two,thirty three,t
hirty four,thirty five,thir
ty six,thirty seven,thirty
eight,thirty nine,forty
  170 REM ** define graphic
s characters **
  180 VDU23,224,0,128,143,2
41,255,127,3,2
  190 VDU23,225,0,0,0,0,232
,252,8,8
  200 VDU23,226,1,3,3,3,15,
25,56,58
  210 VDU23,227,192,224,224
,224,248,204,14,174
  220 VDU23,228,0,0,15,24,1
27,255,24,24
  230 VDU23,229,0,0,192,48,
252,255,24,24
  240 VDU23,230,1,1,1,1,255
,127,63,31
  250 VDU23,231,128,224,0,0
,255,254,252,248
  260 VDU23,232,0,0,224,240
,24,12,15,15
  270 VDU23,234,0,0,0,0,0,0
,252,87
  280 VDU23,235,15,15,12,24
,240,192,0,0
  290 VDU23,236,87,252,0,0,
0,0,0,0
  300  VDU23,237,1,3,2,3,7,
6,7,6
  310  VDU23,238,128,192,64
,192,224,96,224,96
  320  VDU23,239,7,7,6,6,14
,12,24,24
  330  VDU23,240,224,224,96
,96,112,48,24,24
  340 plane$=CHR$224+CHR$22
5:lives$=CHR$226+CHR$227:ca
r$=CHR$228+CHR$229:boat$=CH
R$230+CHR$231
  350 ship1$=CHR$232+CHR$23
4+CHR$10+CHR$8+CHR$8+CHR$23
5+CHR$236:ship2$=CHR$237+CH
R$238+CHR$10+CHR$8+CHR$8+CH
R$239+CHR$240
  360 REM ** define envelop
es **
  370 ENVELOPE 1,1,1,0,0,20
0,0,0,126,0,0,-126,126,126
  380 ENVELOPE 2,1,-7,7,0,1
0,10,0,126,0,0,-126,126,126
  390 ENVELOPE 3,4,90,-15,-
15,10,20,20,126,0,0,-126,12
6,126
  400 REM ** instructions *
*
  410 MODE1:COLOUR 233:CLS:
FOR X=5 TO 35 STEP 4:PRINTT
AB(X,4);car$:PRINTAB(X,28)
:car$:NEXT:VDU28,10,20,30,1
0:COLOUR 200:CLS
  420 PRINTSPC5;"Space  Cou
nt"''SPC5;STRING$(12,"="):VD
U23,1,0;0;0;0;
  430 COLOUR 2:PRINT" You m
ust count the    coloured o
bjects    before Cedric get
s"''SPC9;"home."
  440 COLOUR 3:PRINT"You ha
ve only 3 lives";:COLOUR1:P
RINT''"Press the <Space Bar>
";:*FX15,0
  450 REPEAT UNTIL GET=32:M
ODE1:PROCtop
  460 REPEAT
  470 PROCsetup
  480 PROCgame:U%=0
  490 UNTIL lives%<1
  500 PROChighscore
  510 RUN
  520 END
  530 REM ** define array c
ontaining answers **
  540 DEFPROCsetup
  550 V%=RND(4):IFV%=1THENs
hip$="cars":gra$=car$ELSEIF
V%=2THENship$="boats":gra$=
boat$ELSEIFV%=3THENship$="r
ockets":gra$=ship1$ELSEship
$="spaceships":gra$=ship2$

  560 ans%=0:FORX%=1TO10:FO
RY%=1TO4:val%(X%,Y%)=0:NEXT
Y%,X%
  570 E%=0:REPEAT:FORX%=1TO
10:FORY%=1TO4:C%=RND(5):IFC
%=1THENval%(X%,Y%)=1:E%=1:a
ns%=ans%+1
  580 NEXTY%,X%:UNTILE%=1:c
ol%=RND(5):IFcol%=1THENC%=4
:col$="blue"ELSEIFcol%=2THE
NC%=1:col$="red"ELSEIFcol%=
3THENC%=3:col$="yellow"ELSE
IFcol%=4THENC%=2:col$="gree
n"ELSEC%=5:col$="purple"
  590 PROCmiddle:CLS:VDU19,
2,C%,0,0,0
  600 FORX%=1TO10:FORY%=1TO
4:IFval%(X%,Y%)=1THENPRINTT
AB(X%+4-3,Y%+4);gra$
  610 NEXTY%,X%
  620 PROCbottom:CLS:PRINTT
AB(2);"How many ";col$;SPC1
;ship$;" are there ?";
  630 ENDPROC
  640 DEFPROCtop
  650 VDU28,0,7,39,0:COLOUR
131:COLOUR 0
  660 ENDPROC
  670 DEFPROCmiddle
  680 VDU28,0,28,39,8:COLOU
R128:CLS:COLOUR 2:ENDPROC
  690 DEFPROCbottom
  700 VDU28,0,31,39,29:COLO
UR131:COLOUR 1:ENDPROC
  710 DEFPROCgame
  720 PROCtop:CLS
  730 VDU23,1,0;0;0;0;
  740 PROCtries
  750 COLOUR 1:PRINTTAB(13,
5);"Your answer ="
  760 B$="":T%=1
  770 PROCget
  780 ENDPROC
```

```
  790 DEFPROCget
  800 try%=0
  810 REPEAT
  820 REPEAT
  830 A$=INKEY$(0)
  840 T%=T%+1:IF T%>speed%
THEN SOUND 1,2,0,5:PROCmove
:PROCtop
  850 IF A$<>CHR$(13) AND (
A$<"0" OR A$>"9") THEN A$="
"
  860 IF U%>35 THEN try%=3:
B$=B$+"   "
  870 B$=B$+A$
  880 COLOUR 0:PRINTTAB(27,
5);B$
  890 UNTIL A$=CHR$(13) OR
LEN(B$)>1
  900 guess%=VAL(B$)
  910 IFguess%=ans% THEN tr
y%=9
  920 try%=try%+1:PROCtop:C
LS:PRINTTAB(14);:IFU%>34THE
NPRINT"":GOTO940
  930 IFtry%=10THENGOTO990E
LSEPRINT"That was wrong."
  940 IF try%<4 THEN COLOUR
1:PRINT''SPC3;" Press the
<Space Bar> to continue."
  950 *FX15,0
  960 IF try%<4 THEN REPEAT
UNTILGET=32
  970 A$="":B$=""
  980 IF try%<2 PROCtries
  990 UNTIL try%>1
 1000 IFtry%=10THENPROCwin:
ENDPROC
 1010  lives%=lives%-1:PROC
lose:ENDPROC
 1020 END
 1030 DEFPROCmove
 1040 PROCbottom:PRINTTAB(U
%,2);"  ";:U%=U%+1:PRINTTAB
(U%,2);plane$;:T%=0
 1050 ENDPROC
 1060 DEFPROCtries
 1070 PROCtop:CLS:PRINTTAB(
11,2);"Lives Left  ";STRING
$(lives%,lives$)
 1080 COLOUR 1:PRINTTAB(13,
5);"Your answer ="
 1090 ENDPROC
 1100 DEFPROClose
 1110 speed%=speed%+10:REM
** slow game down for wrong
 answer **
 1115 *FX15,0
 1120 PROCtop:CLS:COLOUR 0:
IFU%>34 THEN  PRINT TAB(10)
;"You were too slow!"
 1125 SOUND 1,3,-15,15
 1130 COLOUR 1:PRINT'TAB(8)
;"There were ":PRINTTAB(8)c
ol$(ans%);SPC1;ship$;".":
COLOUR 0:PRINT"  Press the
<Space Bar> to continue."
 1150 REPEAT UNTIL GET=32
 1160 ENDPROC
 1170 DEFPROChighscore
 1180 PROCtop:CLS:COLOUR1:P
RINTTAB(8,2);"You have scor
ed ";S%
 1190 COLOUR 0:PRINT''" Pr
ess the <Space Bar> for ano
ther game."
 1200 *FX15,0
 1210 REPEAT UNTIL GET=32
 1220 ENDPROC
 1230 DEFPROCwin
 1240 S%=S%+1:*FX15,0
 1250 PROCtop:CLS:COLOUR 1:
PRINT''TAB(8);"Well done."'
TAB(8);"There were ":col$(a
ns%);SPC1;ship$;".":COLOU
R0:PRINT"  Press the <Space
 Bar> to continue."
 1260 SOUND 1,3,100,10
 1270 *FX15,0
 1280 REPEATUNTILGET=32
 1290 ans%=0:speed%=speed%-
5:REM ** speed game up if a
nswer correct **
 1300 ENDPROC
 1310 DEFPROCerror
 1320 CLS:PRINT "";:REPORT:
PRINT" at line ";ERL
 1330 END
```

This listing is included in this month's cassette tape offer. See order form on Page 61.

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'An excellent mixture of games' . . Personal Software – Autumn 1983

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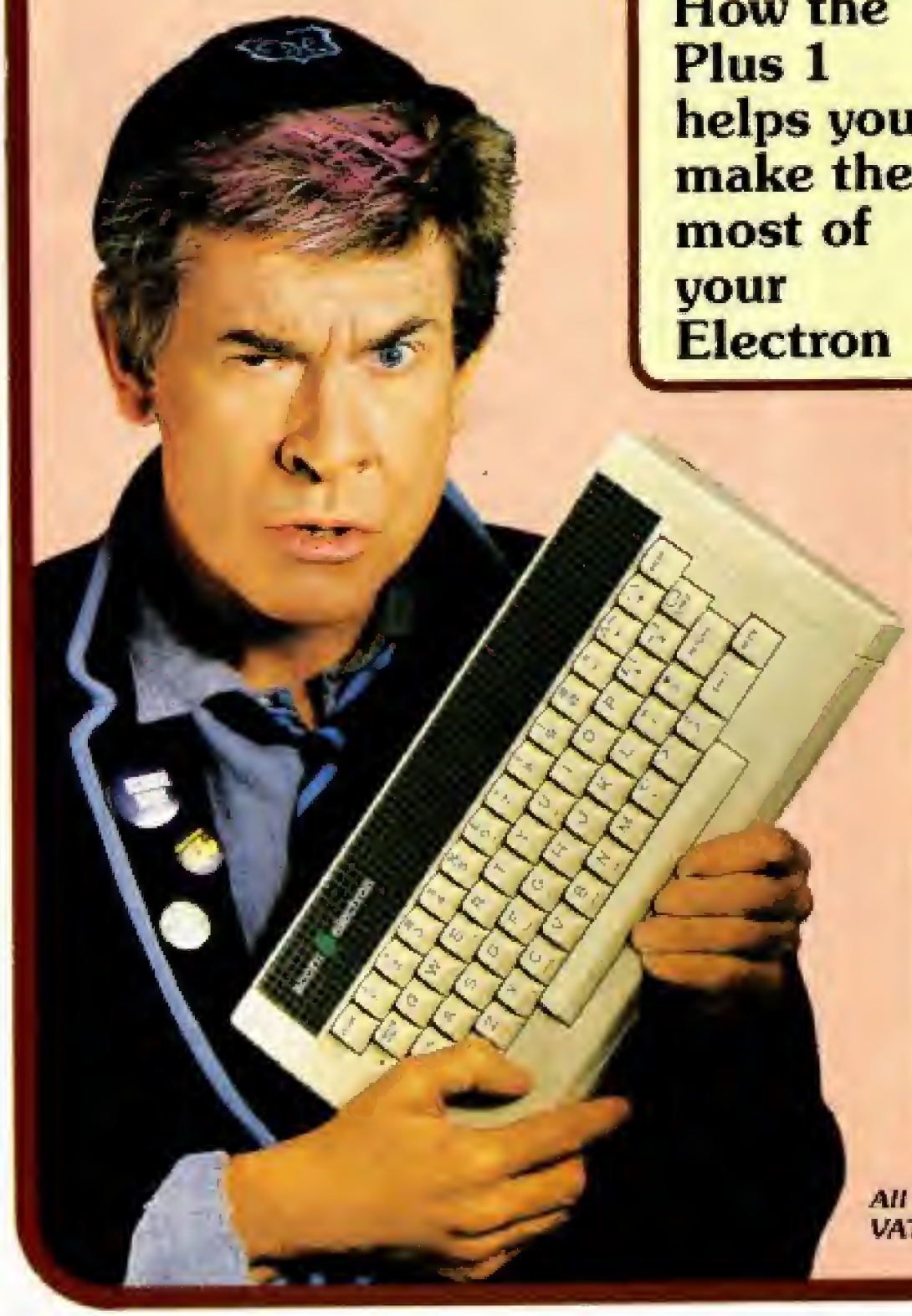

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on Page 61

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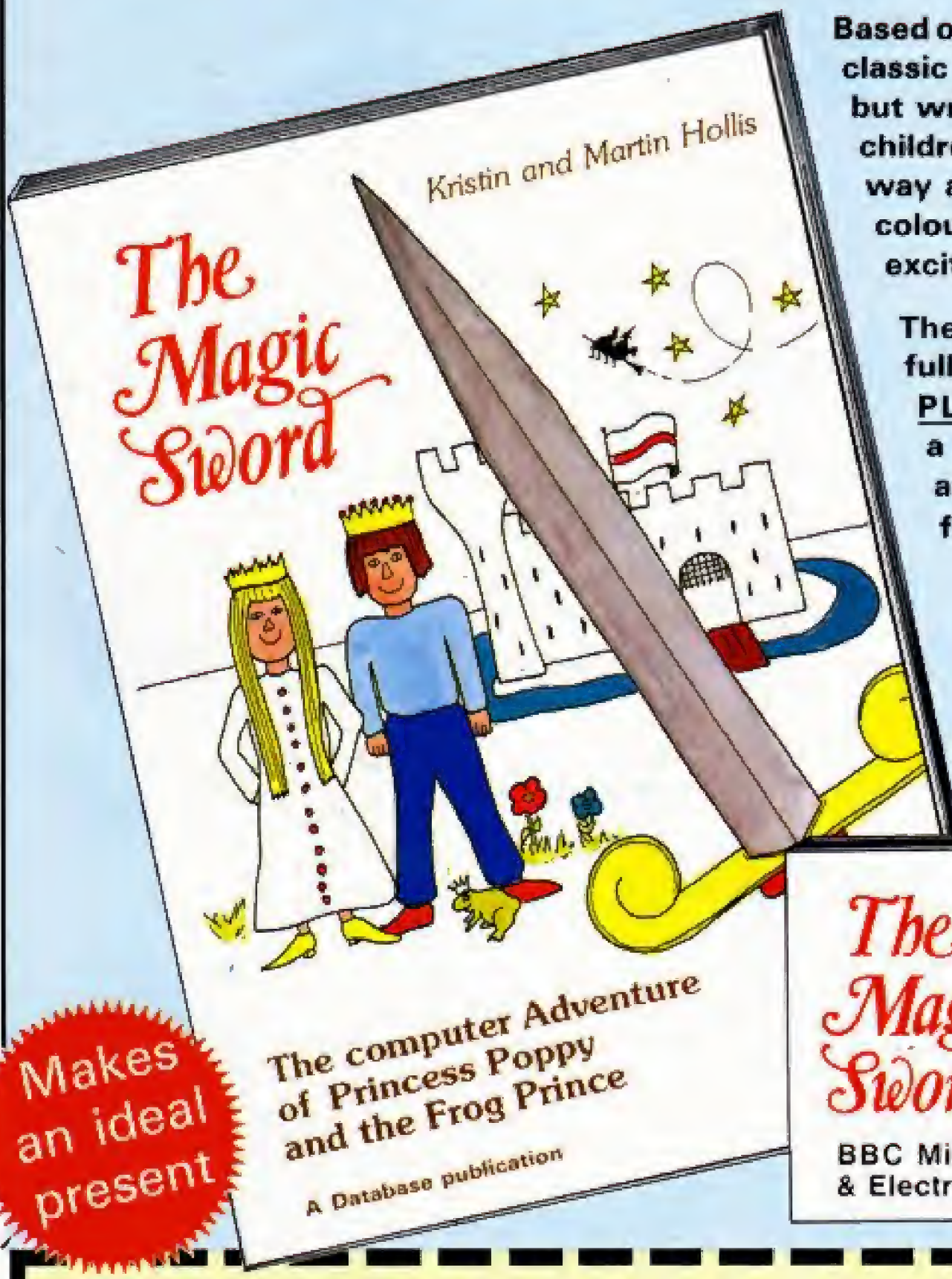

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EU12

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Nightingale has passed the very rigorous tests required by the BABT and is fully approved for use in the UK. This not only means that you can rely upon the safety of the product because of the stringent manufacturing constraints, but also means that because it is a BABT approved product, you can be assured that your application to Telecom Gold, Prestel etc., will not be refused.

Tellstar *The Software*

A fitting partner for the Nightingale modem, Tellstar has been developed from the same stable, and to the same high specification as the best selling BBC communications software COMMSTAR. With its powerful combination of Viewdata and ASCII terminal capabilities contained in one Eprom, Tellstar is the first real communications software available for the Electron and probably the only communications software you will ever need. It will allow you to use to the full, the versatility of the Nightingale modem in accessing information from Prestel, sending/receiving files or sending telex's, downloading telesoftware, etc. Although it is unusually versatile, it is extremely easy to use. A comprehensive manual describes each of Tellstars features in simple terms. Tellstar comes complete with an RS423 Interface developed to an Acorn specification and manufactured by Pace which is connected to your Electron via the Plus 1 Interface.

The Competition

Pace have linked with the premier computer information provider on Prestel, MICRONET and Virgin Atlantic Airlines, all pioneers in their own fields, to offer you a challenge. A chance to try out your skills using your modem and play the 'Pace round Britain Quiz' on Micronet, and in so doing, an opportunity to win a fabulous holiday for two in New York.

This competition will be open to you between November 1st and February 1st if you buy one of our modems before the end of January. In addition, you will be given, free of charge, a full quarters subscription to MICRONET worth £10, and free registration to Microlink on Telecom Gold.

The prize includes a return flight to New York, 6 nights accommodation in a high quality New York Hotel, and spending money to the total value of £400.

Full details are contained with each modem.

micronet 800

Virgin atlantic

Combination of Nightingale Modem, Tellstar and RS423 Interface, special introductory offer £139 plus VAT

PACE

The products and information are available from good quality dealers throughout the country or direct from Pace. Payment accepted by cheque, Access or Visa.

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Tel. 0274 488211 Telex 51564
Telecom Gold mailbox No. PCE 001 Prestel Mailbox No. 274729306

Make it a Merry Micro Christmas

WHY not send the Electron fans among your family and friends an Electronic Christmas card?

This program creates a lovely graphic display to the accompaniment of some festive tunes and gently falling snow. There's even a snowman and a Christmas tree decorated with colourful fairy lights.

Of course you'll want to personalise your card. Line 40 holds the key. Place your name in *from$* and the recipient's in *to$*.

When the card has been drawn, pressing the Q key will switch the carols off. S will switch them back on.

PROCEDURES

assemble	Assembles a short machine code routine to play the carols.
snow	Draws the snow.
chars	Defines the characters.
bell (E,F)	Prints a bell.
move	Moves the snow by redefining the colours.

```
  10 REM Christmas Card
  20 REM D.W.Davies
  30 REM (c) Electron User
  40 to$="ELECTRON USER":f
rom$="D.W.Davies":REM Names
 of sender or receiver must
 not exceed 16 spaces
  50 ON ERROR GOTO 2290
  60 MODE1
  70 VDU23,1,0;0;0;0;
  80 PROCintro
  90 PROCstoredata
 100 PROCassemble
 110 PROCchars
 120 MODE2
 130 VDU5:GCOL0,134:CLG
 140 PROCsnow
 150 PROCcorners
 160 RESTORE2210:FOR N%=1
TO 4:READ E%,F%:PROCsanta(E
%,F%-4):NEXT
 170 PROCbells(E,F)
 180 PROCsa
 190 PROCsanta(128,832):PR
OCsanta(1024,832)
 200 PROCtree
 210 PROCto:PROChc:PROCfro
m
 220 PROCmove
 230 END
 240 DEFPROCchars
 250 VDU23,224,3,7,15,31,3
1,31,0,0
 260 VDU23,225,224,240,252
,224,240,248,0,0
 270 VDU23,226,0,4,4,1,1,0
,0,3
 280 VDU23,227,0,32,32,128
,128,0,0,192
 290 VDU23,228,0,0,0,0,0,0
,63,63
 300 VDU23,229,0,2,2,0,0,0
,252,252
 310 VDU23,230,16,16,16,16
,24,25,31,28
 320 VDU23,231,8,8,8,8,24,
152,248,56
 330 VDU23,232,31,31,31,15
,15,7,7,3
 340 VDU23,233,248,248,248
,240,240,224,224,192
 350 VDU23,234,15,43,43,46
,6,6,0,3
 360 VDU23,235,240,212,212
,116,96,96,0,192
 370 VDU23,236,2,7,7,2,0,0
,0,0
 380 VDU23,237,240,240,240
,240,240,240,240,240
 390 VDU23,238,1,2,4,4,4,8
,8,8
 400 VDU23,239,128,64,32,3
2,32,16,16,16
 410 VDU23,240,16,16,31,32
,64,127,2,1
 420 VDU23,241,8,8,248,4,2
,254,64,128
 430 VDU23,242,0,1,3,3,3,7
,7,7
 440 VDU23,243,0,128,192,1
92,192,224,224,224
 450 VDU23,244,15,15,0,31,
63,0,1,0
 460 VDU23,245,240,240,0,2
48,252,0,128,0
 470 VDU23,247,66,102,60,2
4,0,0,0,0
 480 VDU23,248,126,60,60,6
0,60,60,189,126
 490 VDU23,249,64,64,224,6
4,64,0,0,0
 500 bellone$=CHR$238+CHR$
239+CHR$8+CHR$8+CHR$10+CHR$
240+CHR$241
 510 belltwo$=CHR$242+CHR$
243+CHR$8+CHR$8+CHR$10+CHR$
244+CHR$245
 520 red$=CHR$224+CHR$225+
CHR$8+CHR$8+CHR$10+CHR$226+
CHR$227
 530 white$=CHR$228+CHR$22
9+CHR$8+CHR$8+CHR$10+CHR$23
0+CHR$231+CHR$8+CHR$8+CHR$1
0+CHR$232+CHR$233
 540 vel$=CHR$10+CHR$234+C
HR$235
 550 ENDPROC
 560 DEFPROCintro
 570 COLOUR1:PRINTTAB(13,7
)"CHRISTMAS CARD";TAB(13,9)
"By D.W.Davies"
 580 COLOUR2:PRINTTAB(6,15
)"When Card has been drawn:
-"
 590 COLOUR3:PRINTTAB(6,18
)"Pressing 'Q' will end Car
ols";TAB(6,20)"Pressing 'S'
 will start them again"
 600 COLOUR1:PRINTTAB(12,2
5)"Press 'SPACE BAR'"
 610 REPEAT UNTIL GET=32
 620 ENDPROC
 630 DEFPROCtri(O%,P%,size
%)
 640 VDU25,4,0%;P%;25,0,si
ze%;-size%/2;25,0,-size%*2;
0;25,0;size%;size%;
 650 ENDPROC
 660 DEFPROCtree:VDU18,0,2
:25,4,630;75;25,4,650;75;25
,85,630;0;25,85,650;0;18,0,
1;25,4,600;20;240;18,0,2;
 670 O%=640:P%=150
 680 FOR size%=150 TO 50 S
TEP -25
 690 PROCtri(O%,P%,size%)
 700 P%=P%+40:NEXT
 710 FOR I%=1 TO 40
 720 GCOL0,RND(2)+3
 730 O%=RND(300)+490:R%=RN
D(260)+75:IF POINT(O%,R%)<>
2 GOTO 730
 740 VDU25,4,O%-8;R%+6;249
;
 750 NEXT
 760 ENDPROC
 770 DEFPROCsnow
 780 FOR X%=0 TO 1279 STEP
50
 790 col%=RND(8)+7:down%=-
20
 800PLOT4,X%,RND(32)+1012
 810FOR N%=0 TO 51
 820IF col%>15 col%=8:down
%=-(RND(15)+15)
 830 VDU18,0,col%,25,0,-(R
ND(5)+5):down%;236,8
 840col%=col%+1:NEXT N%
 850 NEXT X%
 860 FOR C%=8 TO 15
 870 VDU19,C%,6,0,0,0
 880 NEXT
 890 ENDPROC
 900 DEFPROCmove
 910 YG%=12
 920 REPEAT
 930 FOR N%=1 TO 15
 940 FORC2%=8 TO 15
 950 C3%=C2%-1:IF C2%=8 C3
%=15
 960 VDU19,C2%,7,0,0,0,19,
C3%,6,0,0,0
 970 change%=RND(2)+3
 980 VDU19,change%,RND(7),
0,0,0
 990 sound%=INKEY(15)
1000 IF sound%=81 THEN *FX
13,4
1010 IF sound%=83 THEN *FX
14,4
1020 IF YG%>60 YG%=12
1030 VDU18,0,7,25,4,RND(98
0)+96;YG%;236
1040 NEXT
1050 NEXT
1060 YG%=YG%+16
1070 UNTIL FALSE
1080 ENDPROC
1090 DEFPROCsanta(X%,Y%)
1100 VDU18,0,1;25,4,X%;Y%;
:PRINTred$
1110VDU18,0,7;25,4,X%;Y%;:
PRINTwhite$
1120 VDU18,0,3;25,4,X%;Y%;
:PRINTvel$
1130 ENDPROC
1140 DEFPROCto:VDU18,0,0;2
5,4,575;944;:PRINT"To":VDU2
5,4,32+(20-LEN to$);894;:PR
INT to$
1150 ENDPROC
1160 DEFPROCfrom
1170 VDU18,0,0;25,4,511;42
4;:PRINT"From":VDU25,4,32+(
20-LEN from$);376;:PRINT fr
om$
1180 ENDPROC
1190 DEFPROChc
1200 A%=22:B%=26
1210 FOR J%=1 TO 2
1220 x%=0:y%=0:c%=7
1230 FOR I%=1 TO 2
1240 VDU18,0,c%;25,4,372-x
%;544+y%;237;25,4,800-x%;59
2+y%;237;
1250 FORY%=A% TO B%
1260 IF J%=1 THEN R%=1 ELS
E R%=3
1270 RESTORE(2090+(Y%+R%-1
6)*10)
1280 REPEAT
1290 READ X%
1300 VDU18,0,c%;25,4,X%*32
-x%;Y%*32+y%;237
1310 UNTIL X%=-1
1320 NEXT
1330 x%=0:y%=0:c%=1
1340 NEXT
1350 A%=15:B%=19
1360 NEXT
1370 ENDPROC
```

From Page 41

```
 1380 DEFPROCbell(E,F)
 1390 VDU18,0,1:25,4,E;F;:P
RINTbellone$
 1400 VDU18,0,3;25,4,E;F;:P
RINTbelltwo$
 1410 ENDPROC
 1420 DEFPROCbells(E,F)
 1430 F=1023:FOR E=2 TO 16
STEP 2
 1440 PROCbell(E*64,F):NEXT
 1450 E=0:FOR V%=1 TO2
 1460 FOR F=5.5 TO 13.5 STE
P2:PROCbell(E,F*32):NEXT
 1470 FOR F=22 TO 28 STEP2:
PROCbell(E,F*32):NEXT
 1480 E=1151:NEXT
 1490 ENDPROC
 1500 DEFPROCcorners:GCOL0,
0
 1510  RESTORE2210:FOR N%=1
 TO 4:READX%,L%:VDU25,4,X%;
L%;25,0,128;0;25,01,-128;-1
04;25,01,128;0;
 1520 NEXT
 1530 ENDPROC
 1540 DEFPROCcirc(X%,Y%,R%)
 1550 VDU25,4,X%+R%;Y%;
 1560 FOR theta=0 TO 360 ST
EP 30
 1570 x%=R%*COS(RAD(theta))
 1580 y%=R%*SIN(RAD(theta))
 1590 VDU25,4,X%;Y%;25,85,X
%+x%;Y%+y%;
 1600 NEXT
 1610 ENDPROC
 1620 DEFPROCsm:GCOL0,7:PRO
Ccirc(350,80,80):PROCcirc(3
50,200,40):PROCcirc(930,80,
80):PROCcirc(930,200,40)
 1630 VDU18,0,0:RESTORE2220
:FOR J%=1 TO 10:IF J%>8 VDU
18,0,1
 1640 READ X%:READY%:VDU25,
4,X%:Y%;236;:NEXT:VDU18,0,0
:PLOT69,325,210:PLOT69,375,
210:PLOT69,905,210:PLOT69,9
55,210
 1650 VDU25,4,322;190;247;2
5,4,904;190;247;
 1660 VDU18,0,0:25,4,323;26
0;248;25,4,900;260;248;
 1670 ENDPROC
 1680 DEFPROCstoredata
 1690 RESTORE 2250
 1700 ?&70=244:FOR I%=244 T
O 1 STEP-1:READ J%:I%?&A00=
J%:NEXT
 1710 ENDPROC
 1720 DEF PROCassemble
 1730 pointer=&70:sound=&71
:!sound=1:sound!2=-15:oswor
d=&FFF1:osbyte=&FFF4
 1740 ?&220=&00:?&221=&09
 1750 FOR pass=0 TO 2 STEP
2
 1760 P%=&900
 1770 [ OPT pass
 1780 PHP:PHA
 1790 TXA:PHA
 1800 TYA:PHA
 1810 LDA #&80
 1820 LDX #&FA
 1830 LDY #&FF
 1840 JSR osbyte
 1850 CPX #10
 1860 BMI end
 1870 LDY pointer
 1880 LDA &A00,Y
 1890 STA sound+4
 1900 DEY
 1910 LDA &A00,Y
 1920 STA sound+6
 1930 LDA #7
 1940 LDX #sound MOD256
 1950 LDY #sound DIV256
 1960 JSR osword
 1970 DEC pointer
 1980 DEC pointer
 1990 BNE end
 2000 LDA #244:STA pointer
 2010 .end
 2020 PLA:TAY
 2030 PLA:TAX
 2040 PLA:PLP
 2050 RTS
 2060 ]
 2070 NEXT
 2080 *FX14,4
 2090 ENDPROC
 2100 DATA 2,3,4,6,8,10,12,
14,16,17,18,21,24,26,28,30,
32,33,34,37,-1
 2110 DATA 2,3,4,6,8,10,12,
14,16,17,18,21,24,26,28,30,
32,33,34,37,-1
 2120 DATA 2,6,8,10,12,14,1
8,21,24,26,28,30,34,-1
 2130 DATA 2,6,7,8,10,11,14
,16,17,18,21,24,26,28,29,30
,32,33,34,37,-1
 2140 DATA 2,6,8,10,12,14,1
6,21,24,26,28,30,32,37,-1
 2150 DATA 2,3,4,6,8,10,11,
12,14,16,17,18,20,21,22,24,
26,28,29,30,32,33,34,37,-1
 2160 DATA 10,12,14,16,18,2
2,27,-1
 2170 DATA 10,12,14,16,18,2
2,27,-1
 2180 DATA 10,11,12,14,15,1
6,18,19,20,22,23,24,26,27,2
8,-1
 2190 DATA 10,12,14,16,18,2
0,22,24,26,28,-1
 2200 DATA 10,12,14,15,16,1
8,19,20,22,23,24,26,28,-1
 2210 DATA 0,1023,1151,1023
,0,103,1151,103
 2220 DATA 300,40,300,70,30
0,100,300,130
 2230 DATA 880,40,880,70,88
0,100,880,130
 2240 DATA 300,205,880,205
 2250 DATA 80,15, 88,5, 80,
10, 68,30, 80,15, 88,5, 80,
10, 68,30, 100,30, 96,30, 1
00,30, 80,30, 88,30, 100,15
, 96,5, 88,10, 80,15, 88,5,
 80,10, 68,30
 2260 DATA 96,10, 88,9, 80,
10, 68,9, 76,9, 80,9, 76,9,
 68,27, 96,10, 88,9, 80,10,
 68,9, 76,9, 80,9, 76,9, 68
,27, 80,10, 0,0, 80,9, 88,1
0, 0,0, 88,9, 96,10, 0,0, 9
6,9, 100,9, 100,9, 96,9, 88
,9, 96,9, 88,9, 80,10, 76,9
, 68,40
 2270 DATA 96,5, 0,0, 96,5,
 0,0, 96,10, 0,0, 96,5, 0,0
, 96,5, 0,0, 96,10, 0,0, 96
,5, 100,5, 80,7, 80,3, 96,2
0, 100,5, 0,0, 100,5, 0,0,
100,7, 0,0, 100,5, 96,5, 0,
0, 96,5, 0,0, 96,3, 0,0, 96
,3, 100,5, 0,0, 100,5, 100,
5, 60,5, 80,40
 2280 DATA 52,10, 72,10, 0,
0, 72,10, 80,5, 80,5, 72,10
, 0,0, 72,10, 80,5, 92,5, 1
00,10, 0,0, 100,10, 100,10,
 92,20, 80,5, 80,5, 92,10,
0,0, 92,10, 100,10, 80,10,
0,0, 80,10, 72,5, 80,5, 80,
10, 60,10, 60,10, 72,40
 2290 MODE6
 2300 REPORT:PRINT" at line
 ";ERL
```

This listing is included in this month's cassette tape offer. See order form on Page 61.

VOXBOX SPEECH SYNTHESISER

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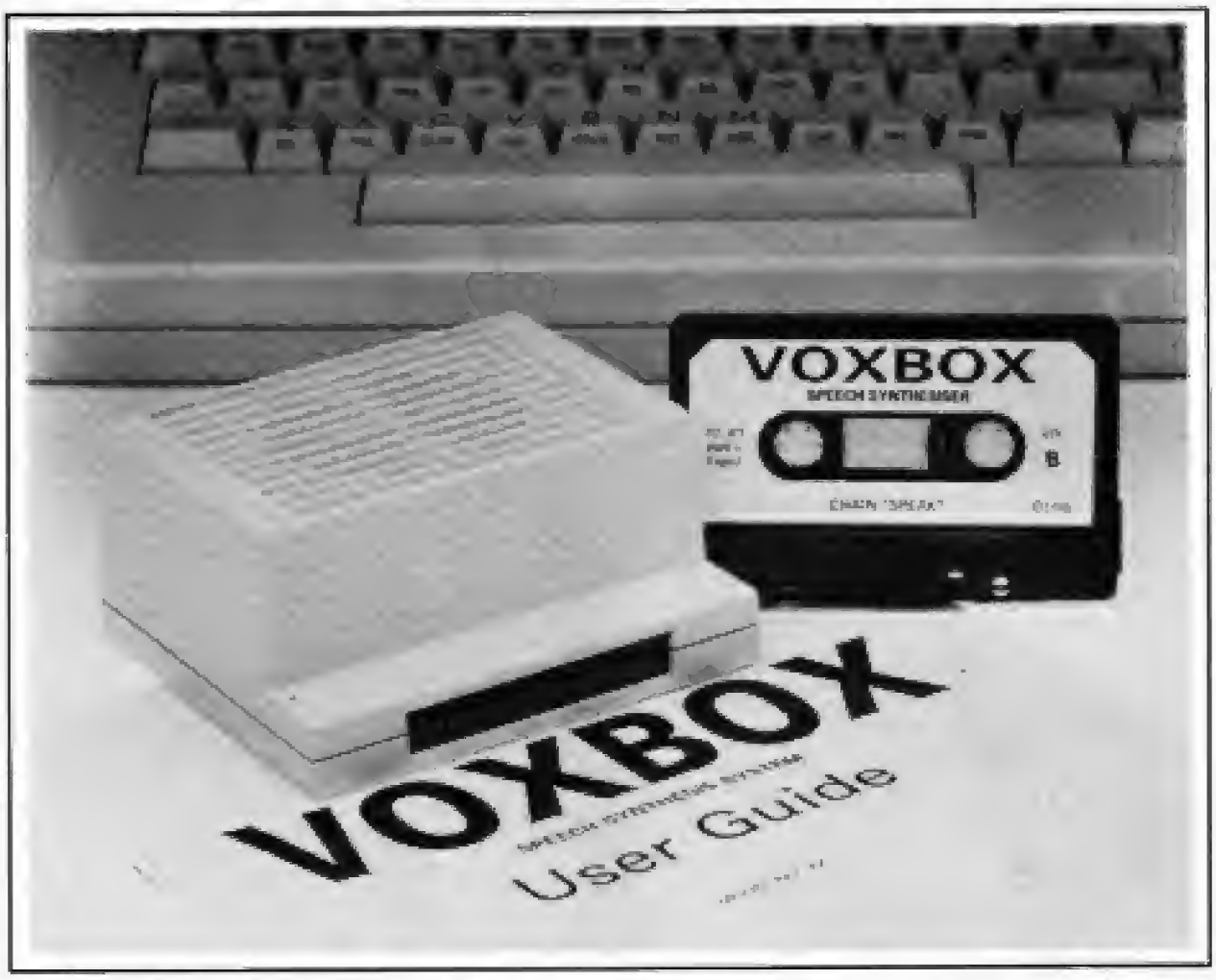

CONTENTS: VOXBOX speech synthesiser, 2 programs on cassette, instruction booklet.

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That Wheel of Fortune is still spinning in the top spot

Adventure Top Ten

1	Wheel of Fortune	*Epic Software*
2	Philosophers Quest	*Acornsoft*
3	Classic Adventure	*Melbourne House*
4	Eye of Zoltan	*Softek*
5	Sphinx Adventure	*Acornsoft*
6	Strange Odessey	*Adventure International*
7	Twin Kingdom Valley	*Bug-Byte*
8	Pettigrews Diary	*Shards Software*
9	Quest for the Holy Grail	*Epic Software*
10	Staff of Law/ Galadriel in Distress	*Potter Programs*

THIS month sees the second of our adventure top tens. As you can see, *Wheel of Fortune* still retains the number one spot, a result that I completely agree with as in my opinion it is the best adventure available for the Electron.

Classic Adventure, Sphinx Adventure and ***Twin Kingdom Valley*** are still doing well, though the other three Epic games have slipped quite a lot.

Pettigrews Diary has made a welcome appearance, as have ***Philosophers Quest*** and ***Eye of Zoltan.***

Potter Programs have two games in at equal tenth and their other adventure, ***Superspy Flint,*** was actually the next highest marked.

Surprisingly (to me), two adventures that I have not yet seen, ***Galadriel in Distress*** and ***Strange Odessey,*** are in there too.

Keep your marks coming in for the next Top 10 in a few months time.

I've bowed to the vast weight of correspondence asking me to do a Sphinx special. Next time I shall be telling you what does what and to who!

Incidentally, I still haven't managed to get all the way through it without that blasted dwarf getting me. Does anyone please know a way of saving a game?

M. Carter has asked me to mention that he has written in as his friend doesn't believe him and Suzanne has asked me to say hello to Sam P. and Sam W. Hello! And that's the last time I'll do that.

Sacha El-Mokaden (hope I got that right Sacha), has written in with a few questions. As far as I know, Acornsoft don't have any new adventures scheduled for release.

I don't know if the ***Fourth Protocol*** is to be released for the Electron – though I hope it will be – and Level 9 have no plans to convert their adventures.

David Johnson, Richard, Ian, Andrew and Lee among others have been asking over the last few months how to put in the fuel capsule in ***Stranded.***

I must confess that I have been telling them to insert the capsule but I have had a reply telling me I was wrong!

I have had another look at it and the solution is to drop the capsule and then pull the lever.

P.G. Peters has followed some earlier advice of mine and shot the robot, but hasn't realised that the recoil has thrown him towards the ship and that he can now go into the airlock and use that lockpick.

Peter Laughton and Steven Bloud have some questions about ***Sadim Castle.*** How do you get the wheelbarrow through the undergrowth, how do you get the knife and where do you dig with the pickaxe?

Ken Edgar can't get through the jammed heavy metal door at the end of the underground tunnel. Can anyone help with any of these problems?

Iain McLean has sent in some useful tips for ***Countdown to Doom*** and has also asked for some help.

- Does the three metre cube have anything to do with the small island?
- What is the purpose of the black hole?
- Can the magnetic generator be switched on and can you enter the surface sewer after going south from the ruined city?

I haven't done so well here myself, so any help will be much appreciated.

Darren Woodward would like to know how to get the pagage off of ***Cleopatra's Needle.*** So would I. I would also like to know what a pagage is!

Andi Sinnott has asked for help with ***The Count*** but has not given me any idea what the problem is. Please write back Andi and tell me where you are stuck.

Kristina Hook Totton has asked some interesting questions about ***Twin Kingdom Valley.***

You can end the game by entering QUIT but once you have done this you can only load in a saved game or restart by loading in the game from scratch.

To save a position on tape you enter in *SAVE and to reload a saved position you type *LOAD. The program does the rest.

Some versions of the game don't seem to accept these commands, in which case I'm afraid you can't save your position.

The reason you keep getting the message "locked" is because you are trying to cheat.

Without getting too technical, the easiest way to explain it is to say that the program has been saved in such a way that it cannot now be LOADed or *LOADed in. It can only be CHAINed or *RUN.

Stuart Moore is having trouble with ***Galadriel in Distress.*** Can anyone tell him how to read the runes on the signs and open the chest in the fire goblins' room?

H. Reynolds can't talk to the ghosts, find the gun or burn the sagebrush charcoal in Ghost Town. Isn't charcoal the result of burning something? Anyway, can anyone help him?

Finally, before moving on to problems I *can* solve, thanks to Simon O'Callaghan I can reveal how to get the keys in ***Greedy Dwarf.***

Light the torch one move north of the rats and throw it south. Easy when you know how.

Hints Department

Richard Hayward and Peter Laughton are both having problems getting into the caves in ***Adventure.*** Richard says he has tried OPEN

SESAME and it doesn't work. It does you know! And that should also answer Peter's question.

Colin Mayner wants some answers to his problems in ***Eye of Zoltan***. SAY the PASSword to get into the castle.

Don't bother with the tiger yet, you need to get something from the castle to protect you.

That maze does contain something you want, but doesn't lead anywhere.

Scott, Tim, Celici and Craig have asked for help with ***Castle Quest.***

The witch doesn't like water but since she is very agile I suggest you find an enclosed space and throw the bucket at her.

You can go two ways to the witch. One way you have already seen all the screens you are going to see, which assumes you have got past the troll.

The other way assumes you have got past the spider, but to see anything further you will have to go back and get past that troll!

A lot of the screens you think you can see are just window dressing.

Matthew Bowen and Andrew Davies have two questions about ***Twin Kingdom Valley*** – how to get the jug of gold and how to kill the dragon?

Try filling the jug and use a staff.

M. Ryan has written in to ask whether there is anything in the maze in ***Classic Adventure.*** Yes and no.

There are two mazes, one contains the vending machine and need not be entered, while the other contains some treasure.

Nicholas Ryba has got the chain in Classic but doesn't know what to do next. Take the bear back the way you came.

Carl Barlow – thanks for the tips on ***Strange Odessey*** by the way – wants to know how to open the keybox in the ***Stolen Lamp.***

Use the grenade to open the box, but do it in such a way as to kill two birds with one stone.

Jason Drew wants to know how to kill the guard and the vizier. Think of the guard as a bird. You can't kill the vizier.

Andrew Clark and Amanda Kemp want to know how to get across the glacier in ***Sphinx Adventure.*** As long as you have got the ring you can use the wand.

Andi Sinnott, Jonathan Lee, Andrew A., S. Kelly, Nicholas Ryba and Jamie Rees are also having problems with Sphinx. Try magic in the spell chamber, though rubbing the ring should be left till last.

The bear will follow you and chase off the orc. Use the cheese past the goblins to catch the mouse – you should feed it.

The mouse is in the dungeons of the vampire's castle. Use your bare hands to kill the dragon.

The only thing you can't do with the bear following you is cross a certain bridge.

Diaxos will help you get back anything the troll takes, even though he keeps it safe for you. The Sphinx is in the desert.

To get past the pirate without losing anything you should map out the locations carefully. When you have found the way round him, use it.

Tony Sweetland and Jason Drew have some questions about ***The Incredible Hulk.*** You can't get in the chief examiner's office without being seen.

To pull the ring in the first room remember what Strange told you. To get the bio gem without the natter egg exploding try eating the egg.

To get past the ants you should make sure that the wax leaves them no orifice to enter.

Patrick Moore (any relation?) wants to know how to get past the ferocious dog in ***Greedy Dwarf.*** Give it a bone.

Chris, James Quinn and H. Reynolds also have some problems with this adventure. Wave something to get down the cliff. I think the burnt scroll is a red herring.

I don't think you can get back through the gate. Drop a sausage and map carefully to get back out of the maze. Kill the spider with the sword.

Yes, there is something north of the cave of echoes – use the amulet to find out what is there.

Simon O'Callaghan and Iain McLean want some help with ***Countdown to Doom.*** The spacesuit is UP and NORTH of the landing area and if you save that blob from falling into the swamp you be rewarded with a trip back in time.

Christian Howells and Eric Clarke are stuck in ***Wheel of Fortune.*** Tell the former about the bull and he will go off to get it. Shoot the

werewolf with the silver bullet.

Once you have got down the well you should explore everywhere and take everything to the canal bank. Then go into the fly's cave and out into the spider's cave.

You now need to go back up through the trapdoor (hint – it's bolted). I'll leave it to you to find out what objects to take with you and what to leave up by the canal.

Simon O'Callaghan and the King of the Valleys (sic) have asked for help with ***Castle Frankenstein.*** The hammer is in the castle kitchen – somewhere. The monster will help with the ring near the experiments room.

Pyramid of Doom is also causing problems for H. Reynolds and for C. Sullivan. Leave the purple worm alone, throw the ruby at the statue and feed the oyster.

Peter Laughton and Ken Edgar would like some help with ***Sadim Castle.*** Use the stake to raise the portcullis. Give the wheelbarrow to the gardener after killing the cheetah with the knife.

Jason McCauley is well and truly stuck in ***Gisbournes Castle.*** The flint is used to fire the cannon. The dynamite is a red herring.

You need the rope and the key to get into the dungeons. Kill Gisbourne and get a key off of him to get into the chapel. Oil the rusty lock to get through.

Geoff Lumley has written in with a lot of questions about ***The Count.*** I haven't received a review copy of this yet but his letter raised such a lot of questions that I went out and bought it.

His first question concerns the capital As that keep cropping up in the text. These are not clues but mistakes!

He goes on to ask if ADEWNTURE and TAKE INORY mean anyting. No, they are also spelling mistakes.

The program also responds with a YOU CAN'T DO THAT YET when you try to fly. Ignore this, you can't fly.

The dedication to Alvin Files and using a mixture of upper and lower case in the opening description are also not clues of any kind.

You don't need to get into the coffin until you are ready to finish the game. The CENTURY OF DUST is a clue to the fact that the room isn't used and therefore a safe place to leave things.

The vents are red herrings. Yes, you can get back into the bedroom from the ledge if you use the right command.

The first night you will get bitten, but the bottle of blood will help on the second night.

The crowd are hostile because you haven't killed Dracula.

Last, but not least, Christopher Morgan can't get the coin in ***Mystery Fun House.*** A sticky problem this!

Chew the gum, stick it on the branch and then you can get the coin from the grating, but make sure that you keep the gum for later.

I'll leave that for you to chew over. See you next month.

ROLAND WADDILOVE presents Part III of his series on

Creating a crafty Plus 3 disc menu

LAST time we had a look at the ADFS directories. Now we are going to delve a bit deeper into the topic and develop an intelligent disc menu for Plus 3 owners.

If you remember, there can be several directories on a disc. To create a new directory you use *CDIR. The currently selected directory is called the CSD.

A directory consists of five contiguous sectors on the disc and is 1280 bytes long.

There's enough room for 47 entries and each entry is 26 bytes long. This is a total of 1222 bytes.

The rest of the space is taken up with its name, title, parent and sequence number.

The sequence number is the number after the name when you *CAT the disc. This is incremented every time you save a file.

Whenever a file is saved, its name, length, load and execution address is placed in the CSD.

It would be very useful if we had access to the directory information. We would then know all there is to know about every file saved.

It's easier than you think to access the CSD. Just place a disc in the drive and type:

```
*MOUNT
```

This loads the root directory $ into memory. If the $ directory contains another called Games, then typing:

```
*DIR Games
```

will load the directory Games into memory. The CSD is the directory currently in memory, loaded to & 1200 and running up to &16FF.

The first byte is the sequence number, followed by HUGO. It was Hugo Tyson that wrote the ADFS, so naturally he put his name in.

These four bytes are followed by the directory entries

Name and access	10 bytes
Load address	4 bytes
Execution address	4 bytes
Length	4 bytes
Start sector on disc	3 bytes
Sequence number	1 byte

Table 1: A directory entry

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So, that just leaves us with the boring bits of what it costs:

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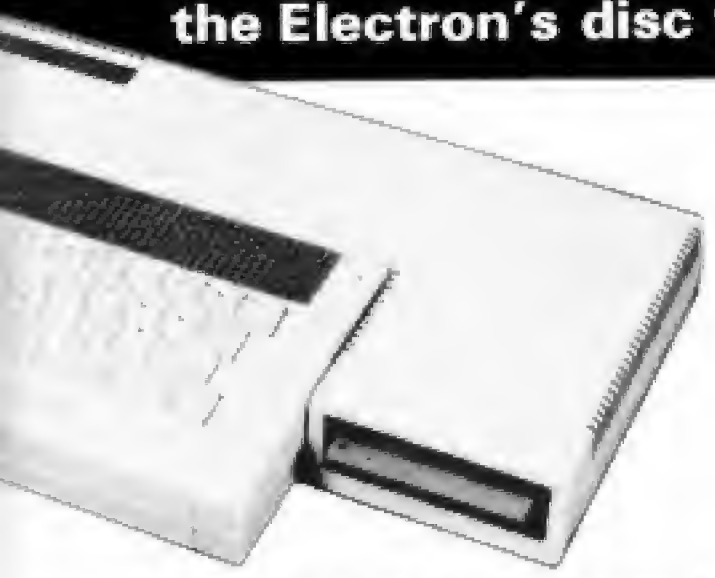

starting at & 1205, each 26 bytes long. A zero byte follows the last entry.

Table I shows how the 26 bytes are used. Enter Program I, place a disc in the drive and type *MOUNT. When it is run the directory entries for all the files in the $ directory will be listed as in Table I.

As you can see from the listing, some fiddling is necessary to print out the name. Bit 7 of the first four characters contain the access flags, so the byte is ANDed with &7F to remove this.

If bit 7 of the fourth character is set, for example, then the entry is a directory. This is useful as we'll see later. The other flags aren't important at the moment.

The name can be up to 10 characters long. If it is less than 10 it ends with a carriage return.

Now that we know all about the files in the CSD we can create an intelligent disc menu program. By intelligent, I mean that it will examine the disc when it is run and create a menu using the information in the CSD.

This means that it will run on any disc and in any directory.

Program II is the listing for the Plus 3 Disc Menu. All the information is in RAM as we've seen, so it's simply a matter of extracting the data we require.

PROCcatalogue looks up the names and prints them in a list on a Mode 1 screen.

If the entry is a directory, found by looking at bit 7 of the fourth letter, then the name is printed in yellow. All other files are in red.

A pointer is placed by the first item. Cursor up and down moves it up and down the list and Return is used to select an item.

If the item selected is a directory then it is made the CSD and a new menu is printed.

Escape is used to move back to the previous directory. This simply executes *BACK. The directory is obtained from &16CC and the title from &16D9.

When an item which isn't a directory is selected, its load and execution addresses are looked up. If the execution address is &8023 it must be Basic, so the file is CHAINed.

An execution address of &FFFF or –1 means it should be EXECed. All other files are machine code, which you have the option of *LOADing or *RUNning.

● *That's all for this month. Next time we'll see how to transfer your unprotected software to disc and set up a !BOOT file to run your disc menu automatically.*

This will be useful for owners of Cumana disc drives as well, so don't miss it.

```
  10REM PROGRAM I
  20a=&1205
  30REPEAT
  40PRINT'
  50i=0
  60char=a?i AND &7F
  70IF char>31 AND char<12
7 VDU char
  80i=i+1:IF (a?i AND &7F)
<>13 AND i<10 GOTO 60
  90IF a?3>127 PRINT "...D
irectory" ELSE PRINT
  100PRINT "Loads to &";~a!
10 AND &FFFF
  110PRINT "Execs at &";~a!
14 AND &FFFF
  120PRINT "File is ";a!10
AND &FFFF;" bytes long"
  130a=a+26
  140UNTIL ?a=0
```

Program I

```
  10REM Plus 3 Disc Menu
  20REM By R.A.Waddilove
  30REM (c) Electron User
  40MODE 1:*DIR
  50VDU 23,1,0;0;0;0;:*FX4
,1
  60ON ERROR IF ERR<>17 RE
PORT:PRINT" at line ";ERL:O
SCLI"FX4":END ELSE CLS:*BAC
K
  70REPEAT
  80PROCcatalogue
  90PROCoption
 100UNTIL chosen
 110MODE 6:PRINT'
 120IF (address!14 AND &FF
FF)=&8023 THEN OSCLI "KEY0
NEW|MCHAIN """+file$+"""|M"
:GOTO 190
 130IF address!14=-1 THEN
OSCLI "KEY0 NEW|M+EXEC "+fi
le$+"|M":GOTO 190
 140PRINT "(1) *LOAD ";fil
e$''"(2) *RUN ";file$
 150REPEAT chosen=GET-48
 160UNTIL chosen=1 OR chos
en=2
 170IF chosen=1 THEN OSCLI
 "KEY0 NEW|M*LOAD "+file$+"
|M"
 180IF chosen=2 THEN OSCLI
 "KEY0 NEW|M*RUN "+file$+"|
M"
 190*FX21
 200*FX138,0,128
 210*FX4
 220END
 230
 240DEF PROCcatalogue
 250files=&1205-26
 260REPEAT files=files+26
 270UNTIL ?files=0
 280files=(files-&1205)DIV
26
 290COLOUR 3:PRINT'" Titl
e:"''"  Dir:";TAB(22)"Escap
e:"
 300COLOUR 2:PRINT TAB(8,1
)FNname(&16D9,19)TAB(6,3)FN
name(&16CC,10)TAB(29,3)"*BA
CK"
 310COLOUR 129:COLOUR 2:PR
INT TAB(1,31)"Use Cursor ke
ys and Return to select";:C
OLOUR 128
 320address=&1205:NX=0
 330IF ?address=0 ENDPROC
 340IF address?3>127 COLOU
R 2 ELSE COLOUR 1
 350PRINT TAB(20*(NX DIV 23)
+2,6+NX MOD 23)FNname(address
,10)
 360address=address+26:NX=
NX+1-(files(23)
 370GOTO 330
 380
 390DEF FNname(A%,length)
 400B%=0:name$=""
 410REPEAT C%=A%?B% AND &7
F
 420IF C%>31 AND C%<127 na
me$=name$+CHR$C%
 430B%=B%+1
 440UNTIL (A%?B% AND &7F)=
13 OR B%=length
 450=name$
 460
 470DEF PROCoption
 480REPEAT UNTIL files
 490NX=0:COLOUR 3:*FX21
 500REPEAT
 510PRINT TAB(20*(NX DIV 23)
,6+NX MOD 23);
 520IF files(23 NX=NX+2*(-
INKEY(-58) AND NX)0)-(INKEY
(-42) AND NX(files+2-2)) EL
SE NX=NX+(INKEY(-58) AND NX
>0)-(INKEY(-42) AND NX(file
s-1)
 530PRINT "  ";STRING$(10,
CHR$9);" ";TAB(20*(NX DIV 23)
,6+NX MOD 23)" )";STRING$(10,
CHR$9);"("
 540UNTIL GET=13
 550IF files(23 NX=NX/2
 560chosen=NX
 570address=(&1205+chosen*
26)
 580CLS:file$=FNname(addre
ss,10)
 590IF address?3>127 THEN
chosen=FALSE:OSCLI "DIR "+f
ile$ ELSE chosen=TRUE
 600ENDPROC
```

Program II

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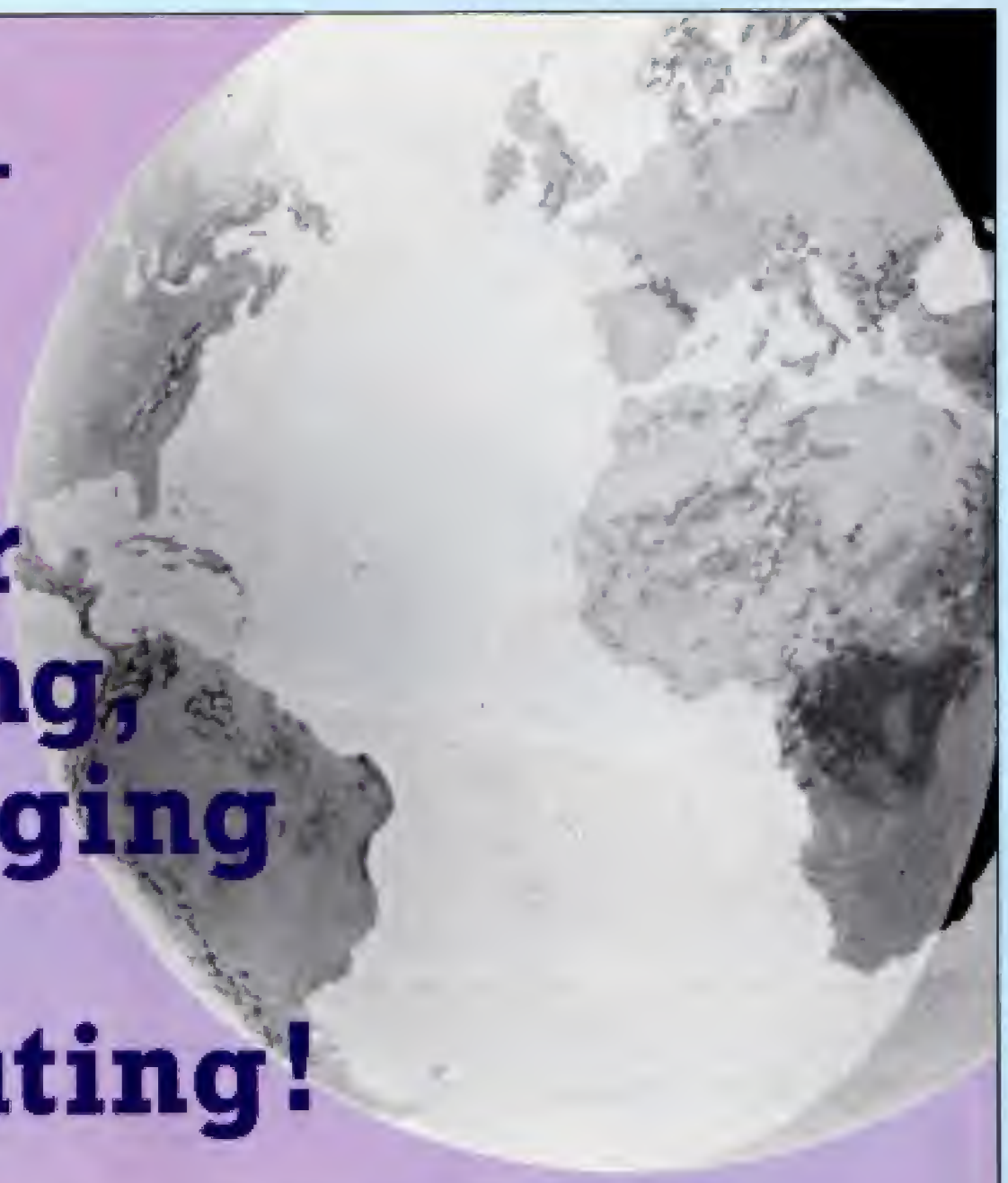

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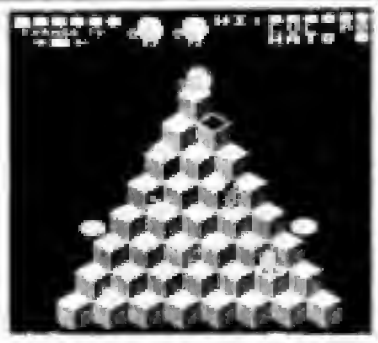

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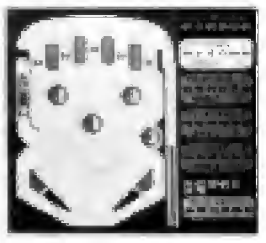

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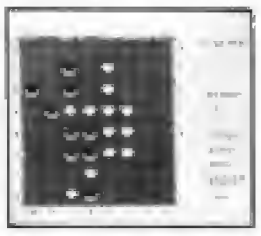

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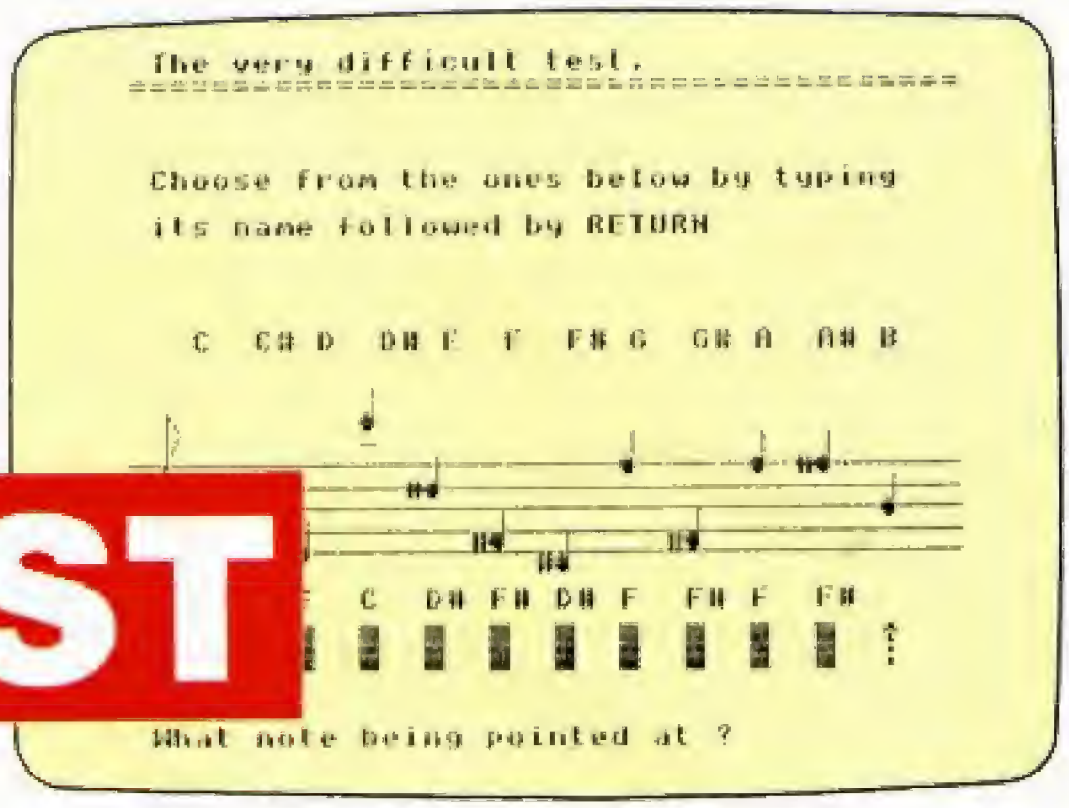

WHEN my son started to learn to play the recorder, I wondered if there was any way in which he could use our Electron to help him.

At about the same time his music teacher at school asked if I could transform an idea of hers into a computer program for the school's BBC Micros.

I had already written a program to show the fingering on a recorder and how it relates to the musical notes. Notest is the result of combining these ideas.

The program has three distinct phases. The first is when the graphics characters, title strings and plotting data are initialised and the various options available during the test are selected.

The options are selected from a menu page which can be recalled at any time by pressing Escape.

Firstly, a starting and finishing level of difficulty are selected. The notes which are available at any level of the test are shown.

Other options include whether the sound effects are to be on or off, and whether the program will automatically go on to the next level of difficulty when a test has been completed successfully.

Also you can choose how many tries you will have to get a test at any level correct before being put out of your misery.

The next phase is the test itself. A treble stave is drawn on the screen and 10 notes, selected from all of those available at the current difficulty, are drawn at random on the stave.

All the notes available are shown by name above the stave and the program will only accept one of these as an answer.

You get three attempts to get the name of the note being pointed at correct.

If the answer is right the note is played, if wrong a rude noise is made and the answer is written under the note. This process is repeated for all the notes.

Finally the program checks if all of the answers are correct and, if so, it moves to the next level – unless it is at the final level, when it prompts for another person to try.

If the test was not correct and the total number of attempts at that level has been exceeded, the program also asks for another user.

If the manual mode has been selected the program will ask if you want to go to the next level.

I know it sounds complicated, but children seem to

→

VARIABLES

ok	TRUE if test was correct.
tries%	Attempts so far.
atmp%	Maximum number of tries allowed.
auto%	TRUE if level raised automatically.
diff%	Current level.
strd%,find%	Starting and final difficulty.
name$	User name.
num$( )	Describes n'th test.
key$	Key press.
diff$( )	Stores available notes for any level.
i%,p%,n%	General counters.
deg$( )	Describes the degree of difficulty.
quest$( )	Stores the questions for any test.
ypos%	Byte array for note position on stave.
ptr%	Offset to byte arrays.
byte%	Byte read from byte array.
crt$	Characters for a crotchet.
vnt$( )	Characters for any note on the stave.
nnt$( )	Names of notes.
bnt%	Byte array storing type of note to draw.
pntr$	Pointer to note under test.
blnk$	Blanks out pointer.
tot%	Score.
lquest%	Note being pointed at.
lgo%	Counts number of tries at any note.
nt%	True if answer is correct.
valid%	True if note is valid for current level.
lans$,li%,lch$	Local variables for FNgetnote.

PROCEDURES

instructions	Display instructions and current level of test.
setup	Set up graphics and plotting data. Also the user options are set up here.
getname	Get user's name.
playnote (n%,l%)	Play note number *n%* for time *l%*.
stave	Draw a treble stave.
shownote(tnt%,xpos%)	Draw note number *tnr%* at position along the stave of *xpos%*.
setquestion	Set up the array *quest$* with a random selection of notes.
answer	Get answers until the test is completed successfully or set number of attempts is exceeded.
FNgetnote	Returns a string describing a valid note.
rasp	Make a rude noise.
score	Assess score and move on to next level if OK.
nextgo	Invite next user to try.

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be able to cope with it very well, and they enjoy using it.

The notes are stored as user defined characters, and plotted on the stave with VDU 5 using positions stored in a byte array called *ypos%* and accessed using byte indirection. This leads both to a faster executing program and more economical use of memory.

The notes can be one of six orientations, depending on whether they are between the lines of the stave, across them, above or below them.

This data is stored in the byte array *bnt%* and accessed in the same way.

Each note is assigned a number from 1 to 25 and a test is set up by setting the string array *quest$(10)* to a random selection of notes from the string array *diff$*. The actual string being used is indexed by *diff%*, the level of difficulty.

String arrays are used because it is easier to use the Basic function INSTR to see if the answer given is a valid one.

One improvement I suggest would be to enable the test to be carried out in a different key signature, but you would have to generate a different version of *bnt%* for each one. Over to you, maestro . . .

```
   10REM Musical notation t
ester
   20REM ** NOTEST **
   25REM (c) Electron User
   30REM MIKE PLUMMER
   40ONERROR GOTO 170
   50*FX225
   60*FX4,1
   70MODE4:VDU 23,1,0;0;0;0
;19,0,7;0;19,1,0;0;:*FX11,0
   80PROCsetup
   90REPEAT
  100PROCinstructions
  110PROCsetquestion
  120PROCanswer
  130PROCscore
  140UNTIL FALSE:END
  150:
  160REM -- Return to menu
when ESC --
  170 IF ERR=17 THEN VDU 4,
24,0;0;1279;1023;:RUN ELSE
MODE6:REPORT:PRINT " at lin
e ";ERL:END
  180:
  190REM -- Print instructi
on menu --
  200DEF PROCinstructions
  210IF NOT ok tries%=tries
%+1 ELSE IF auto% diff%=dif
f%+1:tries=1
  220IF diff%>find% OR trie
s%>atmp% PROCnextgo:REPEAT
UNTIL GET$=" ":PROCgetname
  230CLS:PRINT ''TAB(3)"Mus
ical note test by M.J.Plumm
er"''TAB(3)"----------------
----------------"
  240PRINT''TAB(5)"Hello, "
;name$;"."''TAB(5)"This is y
our ";num$(tries%);" try at
 the"''TAB(5);deg$(diff%);"
test."
  250PRINT''TAB(5)"The comp
uter will ask you to tell"'
TAB(5)"what each of ten not
es are and"''TAB(5)"you will
 have 3 tries at each note.
"
  260PRINT''TAB(5)"You have
 ";atmp%-tries%+1;:IF atmp%
-tries%+1=1 PRINT " go";ELS
E PRINT " goes";
  270PRINT" left to get a t
est"''TAB(5)"at this level r
ight";:IF strd%(find% PRINT
" and if you do"''TAB(5)"the
 next one will be more"''TAB
(5)"difficult." ELSE PRINT"
."
  280PRINT''TAB(5)"If you c
annot get it right in ";atm
p%''TAB(5)"the computer will
 show you the"''TAB(5)"answe
rs and someone else can"''TA
B(5)"have a go."
  290 PRINT TAB(10,30)CHR$7
+"Press SPACE to start":REP
EAT *FX21,0
  300UNTIL GET$=" "
  310ENDPROC
  320:
  330REM -- Define characte
rs and tune --
  340DEF PROCsetup
  350CLS:PRINT ''TAB(3)"Mus
ical note test by M.J.Plumm
er"''TAB(3)"----------------
----------------"
  360PRINT ' '" (1) G,A,B"
'" (2) D,E,G,A,B"'" (3) D,
E,G,A,B,C above middle.?"
  370PRINT'" (4) Scale of C
 major & D"'" (5) Scale of
 C major & D,E,F,G"'" (6)
Two octaves from middle C (
incl 8)"'
  380REPEAT:*FX21,0
  390PRINT TAB(1,6)"Select
 starting difficulty :-   "+
CHR$8;:strd%=GET-48:UNTIL s
trd%>0 AND strd%<7:PRINT TA
B(1,6)"    Starting difficu
lty is ";strd%;"      "+CHR
$7
  400REPEAT:*FX21,0
  410IF strd%<6 PRINT TAB(1
,20)"Select final difficult
y (";stMd%;"-6) :-    "+CHR
$8;:find%=GET-48:UNTIL find
%>=strd% AND find%<7 ELSE f
ind%=6
  420PRINT TAB(1,20)"    Fi
nal difficulty is ";find%;"
      "
  430VDU7:*FX210,0
  440REPEAT:PRINT TAB(1,22)
"Do you want sound effects
(Y/N) ?";:key$=CHR$(GET AND
 &5F):UNTIL INSTR("YN",key$
);:PRINT TAB(1,22)"    Sound
 effects are ";:IF key$="Y"
 PRINT "ON          ":ELSE
PRINT "OFF         "
  450VDU7:IF key$="N" THEN
*FX210,1
  460diff%=strd%-1:tries%=1
  470REPEAT:PRINT TAB(1,24)
"How many tries at problem
(1-9) ?";atmp%=GET-48:UNTIL
 atmp%>0 AND atmp%<10:VDU7:
PRINT TAB(1,24)"    Number
of tries ";atmp%;"
      "+CHR$7
  480REPEAT:PRINT TAB(1,26)
"Automatic move to next lev
el (Y/N) ?";:key$=CHR$(GET
AND &5F):UNTIL INSTR("YN",k
ey$):IF key$="Y" auto%=TRUE
 ELSE auto%=FALSE
  490ok=(strd%=find%):IF ok
 auto%=FALSE:GOTO 520
  500PRINT TAB(1,26)"    ";
:IF auto% PRINT "Automatic"
: ELSE PRINT "Manual";
  510PRINT " level change
              "+CHR$7
  520PRINT TAB(5,28)"Press
 ESCAPE to reset these"
  530PRINT TAB(5,30)"Press
 SPACE to start the test"+CH
R$7:REPEAT:*FX21,0
  540UNTIL GET$=" "
  550IF NOT auto% diff%=dif
f%+1
  560DIM diff$(6)
  570diff$(1)=CHR$8+CHR$10+
CHR$12
  580diff$(2)=diff$(1)+CHR$
3+CHR$5
  590diff$(3)=diff$(2)+CHR$
13+CHR$15
  600diff$(4)=diff$(3)+CHR$
1+CHR$6
  610diff$(5)=diff$(4)+CHR$
17+CHR$18+CHR$20
  620diff$(6)="":FOR i%=1TO
25:diff$(6)=diff$(6)+CHR$i%
:NEXT
  630DIM deg$(6),quest$(10)
  640deg$(1)="very easy"
  650deg$(2)="easy"
  660deg$(3)="slightly diff
icult"
  670deg$(4)="fairly diffic
ult"
  680deg$(5)="difficult"
  690deg$(6)="very difficul
t"
  700DIM num$(9)
  710RESTORE 720:FOR i%=1 T
O 9:READ num$(i%):NEXT
  720DATA first,second,thir
d,fourth,fifth,sixth,sevent
h,eighth,ninth
  730VDU23,234,52,76,132,13
2,132,68,56,0
  740VDU23,235,52,124,252,2
52,252,124,56,0
  750VDU23,236,4,4,4,4,4,4,
4,4
  760VDU23,239,0,0,0,255,0,
0,0,0
  770VDU23,240,255,255,255,
255,255,255,255,255
  780DIM xpos% 26:ptr%=1:RE
STORE 800:?xpos%=0
  790REPEAT READbyte%:xpos%
?ptr%=byte%:ptr%=ptr%+1:UNT
IL ptr%>26
  800DATA0,0,15,15,30,45,45
,60,60,75,75,90,105,105,120
,120,135,150,150,165,165,18
0,180,195,210
  810crt$=CHR$236+CHR$10+CH
R$8+CHR$235
  820DIM vnt$(6):vnt$(0)=""
  830vnt$(1)=crt$+CHR$8+CHR
$239
  840vnt$(2)=vnt$(1)+CHR$8+
CHR$8+"$"
```

Notest listing

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```
  850vnt$(3)=crt$
  860vnt$(4)=crt$+CHR$8+CHR
$8+"#"
  870vnt$(5)=crt$+CHR$8+" "
  880vnt$(6)=vnt$(1)+CHR$10
+CHR$8+"-"
  890DIM rnt$(25):DIM bnt%
26:RESTORE 910
  900ptr%=1:?bnt%=0:rnt$(0)
="None":REPEAT:READbyte%:bn
t%?ptr%=byte%:READrnt$(ptr%
):ptr%=ptr%+1:UNTILptr%=26
  910DATA 1,C,2,C#,3,D,4,D#
,3,E,3,F,4,F#,3,G,4,G#,3,A,
4,A#,3,B,3,C,4,C#,3,D,4,D#,
3,E,3,F,4,F#,3,G,4,G#,1,A,2
,A#,5,B,6,C
  920PROCgetname
  930pntr$="^"+CHR$8+"|"+CH
R$10+CHR$8+"|"
  940blnk$=CHR$240+CHR$10+C
HR$8+CHR$240
  950ENDPROC
  960:
  970REM -- Get the users n
ame --
  980DEFPROCgetname
  990CLS:PRINT TAB(1,10);:I
NPUT"What is your name ? "n
ame$:CLS
 1000ok=TRUE
 1010ENDPROC
 1020:
 1030REM -- Play note n% fo
r time l% --
 1040DEF PROCplaynote(n%,l%
)
 1050SOUND &11,0,0,1:IF n%=
0 ENDPROC
 1060SOUND 1,-15,n%+4+52,l%
 1070ENDPROC
 1080:
 1090REM -- Draw treble sta
ve --
 1100DEF PROCstave
 1110VDU24,0;200;1279;570;:
CLG:MOVE0,300
 1120PLOT1,1279,0:PLOT0,0,3
0:PLOT1,-1279,0:PLOT0,0,30:
PLOT1,1279,0:PLOT0,0,30:PLO
T1,-1279,0:PLOT0,0,30:PLOT1
,1279,0
 1130PLOT0,-1240,-150:PLOT1
,20,0:PLOT1,0,225:PLOT1,20,
-35:PLOT1,-70,-120:PLOT1,65
,-40:PLOT1,20,10:PLOT1,-30,
20
 1140ENDPROC
 1150:
 1160REM -- Show a note on
stave --
 1170DEF PROCshownote(tnt%,
xpos%)
 1180VDU5:MOVExpos%,(vpos%?
tnt%)+315
 1190PRINTvnt$(bnt%?tnt%);:
VDU4
 1200ENDPROC
 1210:
 1220REM -- Set the questio
ns --
 1230DEF PROCsetquestion
 1240quest$(0)=MID$(diff$(d
iff%),RND(LEN(diff$(diff%))
),1)
 1250FORi%=1 TO 10
 1260REPEAT
 1270quest$(i%)=MID$(diff$(
diff%),RND(LEN(diff$(diff%)
)),1)
 1280UNTIL quest$(i%)<>ques
t$(i%-1)
 1290NEXT
 1300ok=TRUE
 1310ENDPROC
 1320:
 1330REM -- Get answer unti
l right or numbers of tries
 exceeded --
 1340DEF PROCanswer:tot%=0
 1350CLS:PROCstave
 1360FOR i%=1 TO 10
 1370PROCshownote(ASC(quest
$(i%))-1,i%*100+155)
 1380NEXT
 1390PRINT'" The ";deg$(dif
f%);" test."'STRING$(40,"="
);
 1400PRINT''''" Choose from
 the ones below by typing"''
" its name followed by RETU
RN"
 1410j%=1:FOR i%=1 TO LEN(d
iff$(diff%))
 1420lquest%=ASC(MID$(diff$
(diff%),i%,1 ))
 1430IF (diff%)2 AND diff%<
6 AND lquest%<15) OR ((diff
%<3 OR diff%=6) AND lquest%
<13) PRINT TAB(i%*3,13);rnt
$(lquest%):j%=j%+1
 1440NEXT
 1450VDU24,0;0;1279;1023;
 1460FOR i%=1TO10:ntX=FALSE
 1470lquest%=ASC(quest$(i%)
):VDU5:IF i%>1 MOVE (i%-1)*
100+155,200:PRINT blnk$
 1480MOVE i%*100+155,200:PR
INT pntr$:VDU4
 1490lgo%=1:REPEAT:valid%=F
ALSE:REPEAT ans$=FNgetnote
 1500FOR j%=1 TO LEN(diff$(
diff%)):IF ans$=rnt$(ASC(MI
D$(diff$(diff%),j%,1))) val
id%=TRUE
 1510NEXT:UNTIL valid%
 1520IF ans$=rnt$(lquest%)
THEN PROCplaynote(lquest%,2
0):nt%=TRUE ELSE PROCrasp
 1530lgo%=lgo%+1:UNTIL nt%
OR lgo%=4
 1540IF NOT nt% ok=FALSE EL
SE tot%=tot%+1
 1550VDU5:MOVE i%*100+155,2
50:PRINT rnt$(lquest%):VDU4
 1560NEXT
 1570ENDPROC
 1580:
 1590REM -- Get a string de
scribing a note from keyboa
rd --
 1600DEF FNgetnote
 1610LOCAL lans$,li%:REPEAT
 1620PRINT TAB(0,30);STRING
$(39," ")+CHR$13;
 1630INPUT " What note bein
g pointed at ? "lans$
 1640IF LEN(lans$)=0 THEN U
NTIL FALSE
 1650lch$=CHR$0:li%=1:REPEA
T
 1660lch$=MID$(lans$,li%,1)
 1670IFlch$>="a" AND lch$<=
"z" lans$=LEFT$(lans$,li%-1
)+CHR$(ASC(lch$) AND &5F)+M
ID$(lans$,li%+1)
 1680IFlch$=" " lans$=LEFT$
(lans$,li%-1)+MID$(lans$,li
%+1) ELSE li%=li%+1
 1690UNTILlch$=""
 1700IF LEN(lans$)>2 UNTILF
ALSE
 1710lch$=LEFT$(lans$,1):IF
 lch$<"A" OR lch$>"G" UNTIL
 FALSE
 1720IF LEN(lans$)=2 IF MID
$(lans$,2,1)<>"#" UNTIL FAL
SE
 1730UNTIL TRUE
 1740=lans$
 1750:
 1760REM -- Rude noise --
 1770DEF PROCrasp
 1780FOR p%= 4 TO 7:SOUND 0
,-15,p%,1:NEXT
 1790ENDPROC
 1800:
 1810REM -- Print score --
 1820DEF PROCscore
 1830q%=INKEY(200)
 1840CLS
 1850PRINT TAB(2,2);"Well,
"name$+","''TAB(2)"you have
 scored ";tot%;" out of 10
in the"''TAB(2);deg$(diff%)
;" test."'''
 1860IF ok PRINT TAB(2)"WEL
L DONE!! ";:IF diff%=find%
GOTO 1920
 1870IF ok AND strd%<find%
PRINT"Now you can try a mor
e"''TAB(2)"difficult test."
 1880IF ok AND NOT auto% PR
INT ''TAB(2)"Do you want to
(Y/N) ?";:REPEAT key$=CHR$(G
ET AND &5F):UNTIL INSTR("YN
",key$):IF key$="Y" diff%=d
iff%+1:tries%=1
 1890IF tot%>7 AND tot%<10
PRINT "  Good, just try a l
ittle harder."
 1900IF tot%<8 AND tot%>4 P
RINT"  Not bad, you got at
least half the"'"  test rig
ht."
 1910IF tot%<6 PRINT "  I t
hink you can do a little be
tter."
 1920PRINT TAB(5,30)"Press
 SPACE to go on"
 1930REPEAT UNTIL GET=32
 1940ENDPROC
 1950:
 1960REM -- Get next pupil
--
 1970DEF PROCnextgo
 1980tries%=1
 1990CLS:PRINT ''TAB(2)"Tha
t is the end of your turn,"
''TAB(2)name$;"."''TAB(2);
 2000PRINT TAB(10,20);:IF o
k PRINT "SUCCESSFUL" ELSE P
RINT "FAILED AT LEVEL ";dif
f%
 2010PRINT TAB(10,30)"Press
 SPACE to go on":REPEAT UNT
IL GET$=" "
 2020ENDPROC
```

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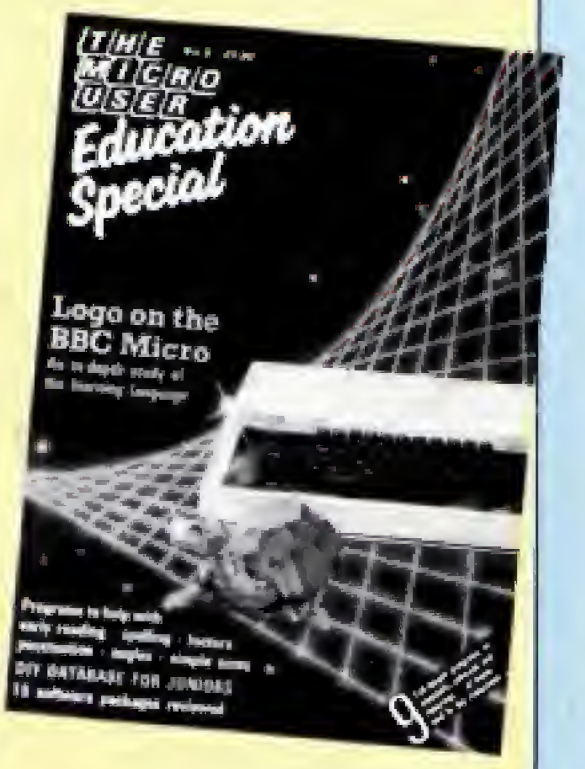

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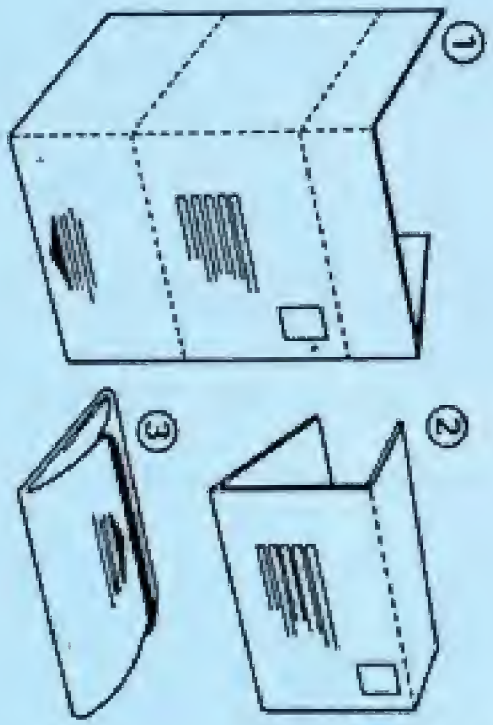

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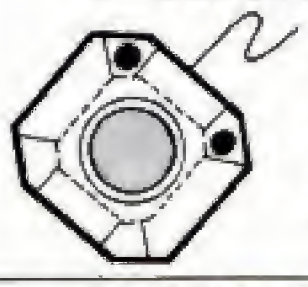

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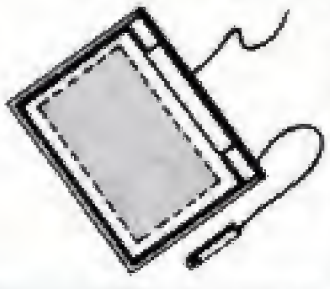

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Notebook

THIS month's notebook program is a bubble sort routine which takes an unordered list and puts them into order. In this case it's a set of letters that want to go into alphabetical order but it could be numbers. Try it and see.

```
10 REM BUBBLE SORT
20 REM SLOW BUT SURE
30 count=10:holding$=""
40 DIM record$(count)
50 FOR loop=1 TO count
60 READ record$(loop)
70 NEXT loop
80 FOR span=count-1 TO 1
STEP -1
90 noswap=TRUE
100 FOR comparison =1 TO
span
110 IF record$(comparison
)>record$(comparison+1) THE
N holding$=record$(compari
son):record$(comparison)=rec
ord$(comparison+1):record$(
comparison+1)=holding$:nosw
ap=FALSE
120 NEXT comparison
130 IF noswap=TRUE THEN s
pan=1
140 NEXT span
150 FOR loop=1 TO count
160 PRINT record$(loop);"
";
170 NEXT loop
180 PRINT
190 DATA j,d,e,i,c,f,h,b,
g,a
```

Initialises variables

Reads data into arrays

Flag

Decreasing range of items

Checks each pair in span

Compares adjacent items and swaps them if necessary

Exits outer loop if no swap has occured on last inner loop

Prints out sorted list

Items to be sorted

Add the following lines and, when you press the space bar, you'll see how the sort progresses.

```
 5 span=0
25 MODE 1
33 mark=count
:comparison=0
71 PROCprint
73 wait$=GET$
75 PRINT
115 COLOUR span MOD 2 +1
117 PROCprint
121 wait$=GET$
123 PRINT
141 COLOUR 3
:PROCprint
142 END
143 DEFPROCprint
161 IF loop=mark
AND comparison=span
THEN COLOUR 3:mark=mark-1
185 ENDPROC
```

Trevor Roberts

PROGRAM NOTES

10,20 Give a name to the program and also describe it all too accurately.

30 This initialises the numeric variable *count*, which holds the number of items to be sorted. If you want to change the number of items, all you have to do is to insert them into the data statement of line 190 and alter *count*. The string variable *holding$* is used later in the program to store a temporary value. It's a scratchpad variable.

40 The DIM sets aside space for a string array *record$()* consisting of count + 1 elements.

50-70 Form a FOR ... NEXT loop which READs in values from line 190 and stores them in the array elements *record$(1)* to *record$(10)*.

80-140 Make up the bubble sort which consists of two nested FOR ... NEXT loops. These compare each successive pair of *record$()* and, if the contents of one is larger than the other, swaps them. Eventually, as the comparisons go on, the largest element of the array "bubbles" to the stored in *record$(10)*. Then the process starts again on the nine remaining unsorted *record$()*.

80,140 Define the outer loop. This has the control variable *span* which ranges from *count-1* to 1, descending in steps of 1. As *span* gets smaller, so the range of the *record$()* that are to be compared, pair by pair, gets smaller.

90 *noswap* is a flag that is initially set to TRUE. The state of the flag is effected by what goes on in the inner loop.

100-120 Make up the inner loop, the one that does the swapping if it becomes necessary. The control variable *comparison* goes from 1 to the current value of *span*.

110 Compares *record$(comparison)* with the next element *record$(comparison+1)*. If they are out of order they are swapped, using *holding$* as a temporary store. If a swap has occurred then *noswap* is made FALSE.

120 By the time the inner loop is completed each pair of elements in the span being considered will have been compared and, if necessary, swapped. The largest element will be in the rightmost position. Try working through the program on paper using *count=4* and trying to sort *d,a,b,c* and you'll see what happens.

130 If the inner loop has compared every element in a particular span and they are all in order *noswap* will still be true. There's no point in further sorting so *span* is set to 1, terminating the outer loop.

140 By the time the outer loop is finished every element in the array will be in its correct position.

150-170 Print out the rearranged array.

190 Holds the items to be sorted.

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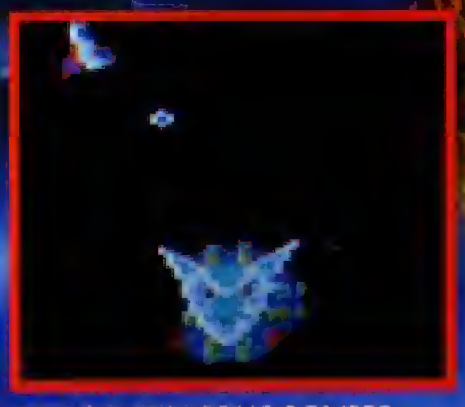

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Micro Messages

Keep it clean – keep it going

*MAY I make a quick rejoinder to your reply to my letter about dirty heads (*October Electron User*).*

I have been using audio tape recorders for many years, from a reel-to-reel Ferrograph to modern Sony cassette type (that should show my age!)

Only once have I had a tape head out of alignment – that was after a recorder had fallen 15ft from the branch of a tree.

Since computer equipment is not usually subjected to such robust treatment, I really cannot believe tape heads frequently cause trouble from this problem.

If a tape head were completely filmed over with dirty grease it would indeed cause problems with all tapes.

However, I find the greater problem arises from small particles which shift around with the passage of the tape causing intermittent faults.

Equally, a long tape not only needs a pretty healthy drive – usually found only on audio cassette units – but can itself become distorted with frequent use.

As a simple analyst I have acquired an undeserved reputation as a computer doctor because when I am told "the computer is down", I clean the disc heads and all is well again (saves calling the serviceman out).

Exactly the same applies to cassette heads. – **R.H. Hill, Woodford Green.**

● Tape head alignment is often different on different tape recorders. So, while a tape may load perfectly on the tape recorder it was saved on, it may not load on a totally different one.

Golden outlook

READING through the October issue of your wonderful magazine I couldn't believe my eye's when I saw Beach-Head by US Gold out now for the Electron.

Do you know whether US Gold are making any other fabulous games for the Electron?

Also in the October Electron User *I saw the article on the Voxbox speach synthesiser. Is it worth the money?* – **Jonathon Timms, Billingshurst.**

● We'll be reviewing Voxbox as soon as possible, and you'll be able to make your own judgement.

No doubt US Gold will follow up Beach-Head with another superb game as they seem to have the talent for coming up with original and exciting themes.

Trapping the fiend

I'VE just read your review of Alligator's Bumper Bundle in the September Electron User. *I've got the cassette and my son and I have had a lot of fun with the games.*

About Mell Moll: the fiend, as you call him, is a mechanical robot who can't be killed, he can only be bopped on the head by a skull to push him down one blockspace.

In the early levels you can block his path by strategic placing of skulls.

If you're lucky you can sometimes trap him in the skeleton chamber, after you've got the crystals, by sealing the exit with a skull.

However, since he's somewhat erratic, you can't always plan very well.

It's an interesting game with a fair bit of strategy, lots of luck, and some skill in getting up the difficult entrance to your own side.

My nine-year-old is far better than I am at playing, having reached level 9 and a score in the 54,000 range! My best is approximately 42,500, level 4. – **Alice Morland, Glasgow.**

● Thanks a lot, Alice. We can't wait to put your tips into action.

Memory routine

WHILE trying to run programs such as Starfigher and Manic Mole I have been having some problems with memory.

Could this be due to the connection to the disc system of my BBC B and if so could you tell me how to overcome this problem? – **Peter Maher, London NW10.**

● Both these programs will run on the BBC Micro. They do need downloading to &E00 though.

Plus 3 owners will experience the same problem. The routine you need was in Micro Messages last August.

Revs for the Electron?

I HAVE just seen the new Acornsoft game, Revs, for the BBC Micro. The inevitable question is, "Will it be available for the Electron in the near future?"

I have always liked racing games but this one seems to stand out from the rest.

The graphics are excellent and from the reviews I have seen it looks another masterpiece from Acornsoft which would be greatly appreciated by Electron owners.

I would also like to know when the Elite replacement will be available as I think some things in the game need to be polished up a little.

I think I have a problem with Eddie Kidd's Jump Challenge. When the game starts you are on a BMX which has no problems, but once you get on to the motorbike a loud buzz starts, which wasn't there when it was new.

Could you tell me if this is meant to happen or not. – **Martin Egdell, Hull.**

● Revs is unlikely to be converted for the Electron – we'd love to be proved wrong though.

What's wrong with Elite, it's one of the best games around?

We're not sure what is wrong with your motorbike. It sounds like the exhaust is blowing a bit.

Helping hand

WHEN I first bought my Electron I thought I had made a mistake as there didn't seem to be much software and computer magazines above all, no help.

Then I bought Electron User *(Acorn User seemed to be all BBC B, no Electron) and what a find! It gives more help, better listings and so on than any other magazine.*

In Micro Messages August 1985, David Molyneux's Overdrive routine worked beautifully. I got well over 100,000 (after 100,000 the score resets to 0).

Will Manic Miner ever be made for the Electron? The same goes for Underworld and Sabre Wulf from Ultimate.

I want to know as my friends with Spectrums want to see it on the Electron.

Do you recommend the

→

From Page 67

Plus 1 Interface or the First Byte Joystick Interface? We can't make up our minds. – **Paul and Stephen Moore, Luton.**

PS: Also, which is a good, but cheap printer?

● Manic Miner hasn't been converted for the Electron, but there are plenty of similar games. Take a look at Blagger from Alligator.

Both interfaces are good, and both work with some of the games, but neither with them all.

Do you need the printer port and ROM sockets? If you do, then go for the Plus 1. Otherwise there's not much between them.

The only low-cost printers we've used are Brother. The quality is reasonable and they're good value for money.

WHAT would you like to see in future issues of Electron User?

What tips have you picked up that could help other readers?

Now's here is your opportunity to share your experiences.

Remember that these are the pages that you write yourselves. So tear yourself away from your Electron keyboard and drop us a line. And please, if you want a reply, enclose an SAE. The address is:

Micro Messages
Electron User
Europa House
68 Chester Road
Hazel Grove
Stockport SK7 5NY.

Problem from space

ALTHOUGH a novice with the Electron, having had mine for just over two months, I must agree with Marilyn Rodger (Micro Messages, September) that there is something wrong with the listing of the game Higher or Lower in the July issue. I have checked my copy of the game three times and there are no errors, but as it stands it will not run in Mode 1.

After listing it and finding it wouldn't work, I thought it must have been an error on my part, but I tried changing to Mode 5 on line 40 after reading Marilyn's letter, and found that the game now runs OK except for the distorted cards.

Surely this points to the original mode being wrong, but how does one now get the cards back to normal?

Before you ask, I don't have a Plus 3 or any other additional hardware attached to my Electron, so why am I running out of memory? – **Larry Horsfield, London SE7.**

● It sounds as if you've added a few extra spaces to your listing. (We can assure you ours is accurate.)

The memory is rather tight with this program, so spacing the text out will cause a "No room" error or "Bad mode".

Trouble with the police . . .

AS a couple of budding stuntmen, my brother and I are keen on Dare Devil Denis (Visions Software).

We would recommend this game to anyone, but we are left wondering if it is possible to get past the policeman and the tree in the third line of board 1 in level F (Ace).

We have never managed it and would like to hear from anyone who has. – **S. Whigham, Prestwick.**

● Can anyone help with Dare Devil Denis? We're too cowardly to try it . . .

Printer program

IN the October issue of Electron User *in the Software Surgery section Roland Waddilove reviews the View ROM cartridge from Acornsoft, and states that there is a printer driver program available.*

We have been trying for some time to get such a program, and would be very grateful if you can let me know its source.

We have an Olivetti ink jet printer, and would like to know if the above-mentioned program will handle all the excellent capabilities of this printer.

Incidentally, we have a View cartridge for our Electron, and agree with all Roland Waddilove says.

While we also agree with him that the printer program should have been included in the cartridge, we have to make whatever other uses we can of the available data. – **Basil Crowhurst, Croydon.**

● Acornsoft has produced a View printer driver package for

More educational software

THANK you very much for the list of educational programs in the recent issue of Electron User.

I've sent off for details of many of those listed and now have the problem of deciding what to buy, whereas before I had to buy whatever I could find.

I have, however, in my search for educational programs found several which you have not listed and therefore enclose a list for you so that a possible supplement could be published, as no doubt others will have come across other programs which you did not include in your guide.

I have enjoyed the programs you publish, though my typing needs great improvement. – **Joan Langley, Twickenham.**

Collins Software, Collins Educational, Freepost, Glasgow G4 0YX. Tel: 041-772 3200.
Paddington's Shopping Mix Up.
Paddington and the disappearing ink.
Paddington's problem picture.
Paddington's early visit.
What's the time?
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Hill MacGibbon Ltd, St Bartholomew House, 92 Fleet Street, London EC47 1BH. Tel: 01-353 6482.
Pan Course Tutors – Biology, Chemistry, Maths, Physics, Economics, French.

Willow Software, The Willows, Wrington Lane, Congresbury, Bristol BS19 5BQ. Tel: 0934 834056.
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Highlight Software, 36 Sherbourne Close, Barry, South Glamorgan CF6 5AQ. Tel: 0446 745482.
Reading Pack 1, 2, 3, 4.
Bert Boot.
Entertaining English

Ampalsoft, 31 Woodbridge Road, Darby Green, Blackwater, Camberley, Surrey. Tel: 0252 876677.
Fun Sums.
Sum takeaway.
Adder sums.
Sums times.
Sum measure.
Measure sum more.
Fun words.

Gemini Marketing Limited, Unit 21, Concorde Road, Dinan Way Trading Estate, Exmouth, Devon EX8 4RS. Tel: 0395 265165.
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Edward Bear Tells the Time.
Felicity Farm Girl.
Counting Fun.
Pirate Pedro.

Micro-Aid, 25 Fore Street, Praze, Cambourne, Cornwall TR14 0JX. Tel: 0209 831274.
Hangman.
Distances.
Flags.

Tuxsoft Cooperative Ltd, PO Box 1, Tuxford, Newark, Notts. NG22 0JX.
Pack A – Norman Number Man/What's the Temperature? with the Ghost Game.
Pack B – Number Check/Speed Arithmetic with Number Catch.
Pack C – Tables Tester with Bonus Shoot Out/Tables Square.

The following apparently produce programs for the Electron, though I've not received catalogues yet:

Tutorial Software, Dept. M1E, Wirral L61 1AB.

Chaddington Software, 14 Selkirk Close, Worthing BN13 1PK.

Micro Jen Software, 81 Squirrels Heath Road, Harold Wood, Essex RM3 0LR.

the BBC Micro. As View is virtually idential on both micros it seems likely that that printer drivers work also. Has anyone tried them?

Alive and kicking

I HAVE owned an Electron for about 18 months and have waited patiently for the glut of Electron software.

Sadly it never materialised. Oh sure we have had classics like Elite, Micro Olympics and Cylon Attack, but the Electron has never had a solid support of all types of software.

I have seen the slow increase of software available for the Electron in the shops, but now, alarmingly, there has been a sudden famine.

It annoys me that the shop which eagerly sold an Electron to me (Granada) haven't the decency to support the machine with software.

It used to, but a few weeks ago I noticed that no new games had appeared on the shelf.

When I asked the assistant why, she told me that because of dwindling interest in games for my machine they would not stock any more software. Other shops are doing the same.

Are all my future purchases going to be by mail order? If so, how long will it be before that oasis dries up?

Anyway less doom and gloom, and a few tips for Elite.

When you have shot an opposing craft, if he has launched an escape capsule pick it up with your fuel scoops and you will have gained one ton of slaves.

Also, has any one else ever found a planet that sells alien items? I am in Galaxy 7 and have never found a planet which sells these items.

I have presently 253,987.1 cr. and have a combat rating of Deadly.

I have watched Micro Messages grow from one pege to several pages. It's my favourite part of the mag, along with Electron News at the front. – **A.P. Larsen, Runcorn.**

PS: Thank Merlin for all his tips for TKV but I am no closer to getting anywhere in it. I cannot get into the cave, I go down the grate only to be thrown into a dungeon with a guard outside.

Maybe I am just not an adventurer. I bet you are sick of hearing about Twin Valley.

● The Electron is far from dead. Recent price reductions make the micro an excellent bargain.

We would expect to see an increase in sales, and a large increase in the number of enthusiasts.

There has been a mini flood of software recently, with several new games coming out in time for Christmas. See this month's Software Surgery for details.

Drive choice

I AM thinking of buying a disc drive but do not know whether to buy the Plus 3 or the Cumana 5¼in system.

We have Cumana drives at school so I would be able to use school software at home. But if Acorn bring games out on disc it will be for the Plus 3.

– **M. Bailey, Leyton.**

● Since your prime concern seems to be compatibility, you would probably be better off with the Cumana disc system. This would allow you to transfer unprotected software from school to home and vice-versa.

However, as you'll see from the other pages of our magazine, the Plus 3 is being offered at a very competitive price and is, of course, the official disc upgrade.

Uses for plug-in RAM

I RECENTLY acquired a Slogger Rombox for my Electron. In the accompanying literature there is mention of plugging in extra RAM.

Could this extra RAM be used for programming or is it only pagable memory?

If the latter, would it be possible to use this memory for absorbing some, or preferably all, of the screen's needs?

That is, could the 20k or memory used by the screen in Modes 0, 1, 2 be shunted into this extra RAM leaving more programmable memory free for user use?

I have a second problem which I hope someone may be able to help me with.

I have a copy of the word processor View, and would like to be able to incorporate the Greek alphabet into files.

This is not difficult in itself, but I cannot obtain hard copies of these files, as the printers available to me steadfastly refuse to acknowledge the presence of the graphics.

I can obtain access to two different Epson printers, the RX80 and an MX80. Suggestions would be gratefully received. – **K.V. Kirk, Reading.**

● The Slogger Rombox will accept 8k or 16k RAM. Unfortunately this cannot be used for Basic programs or for the screen memory.

It can be used for ROM software though. There will be an article shortly demonstrating the use of sideways RAM in the Slogger Rombox and ACP's RAM cartridge.

Can any readers help with the printer problem?

Interface tips

I HAVE a Powersoftware joystick interface and was terribly disappointed when I found that Elite, Acornsoft's classic, was not compatible with it.

Since then I have bought many games and have found that Gauntlet and Ghouls also do not work with my interface.

This time I could not sit back. I changed the programs so that the two games work.

With Ghouls you must load the first part of the program and when the title page appears you must Break it and then type OLD and LIST it.

Now type:

```
LIST 4700
```

Then delete the whole line by typing:

```
4700
```

*Now type in *JOY and put in the keys (method 1). Then instead of typing CHAIN"" type:*

```
RUN
```

Now let it run on and load in. Your joystick will work. For Gauntlet the procedure is roughly the same except before loading type:

```
*OPT1,2
LOAD"GAUNTLET"
```

As soon as it loads you will get the prompt sign>_ Type LIST then:

```
LIST 4700
```

Delete this line by typing:

```
4700
```

*Now *JOY, use method (1) and instead of typing CHAIN"" type RUN. It gave me great satisfaction when my joystick worked* – **Robert Sloan, Chigwell.**

● Thanks for the tips Robert.

Line lost

I RECEIVED the November issue of Electron User *last week and was very eager to enter the Sprite program on page 18.*

However when I got to line 170 I found that the first half of it was missing.

I have typed in the rest of the program so if you would be kind enough to furnish me with the contents of this line I would be most grateful.

Before I go, I must say that I typed out your Karate game and was very pleasantly surprised with the results as was my son!

Terrific magazine, keep up the good work. – **R.A.H. Barker, Edgware.**

```
170osrdch=!&210 AND &FFFF
:osbyte=!&20A AND &FFFF
```

● Sorry about line 170, seen in its full glory above, which apparently dropped off the page. We'll use stronger glue next time!

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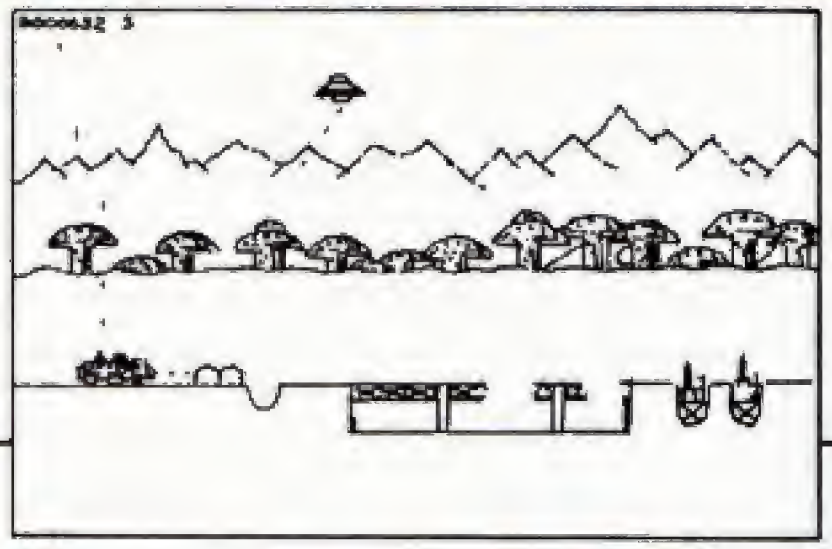

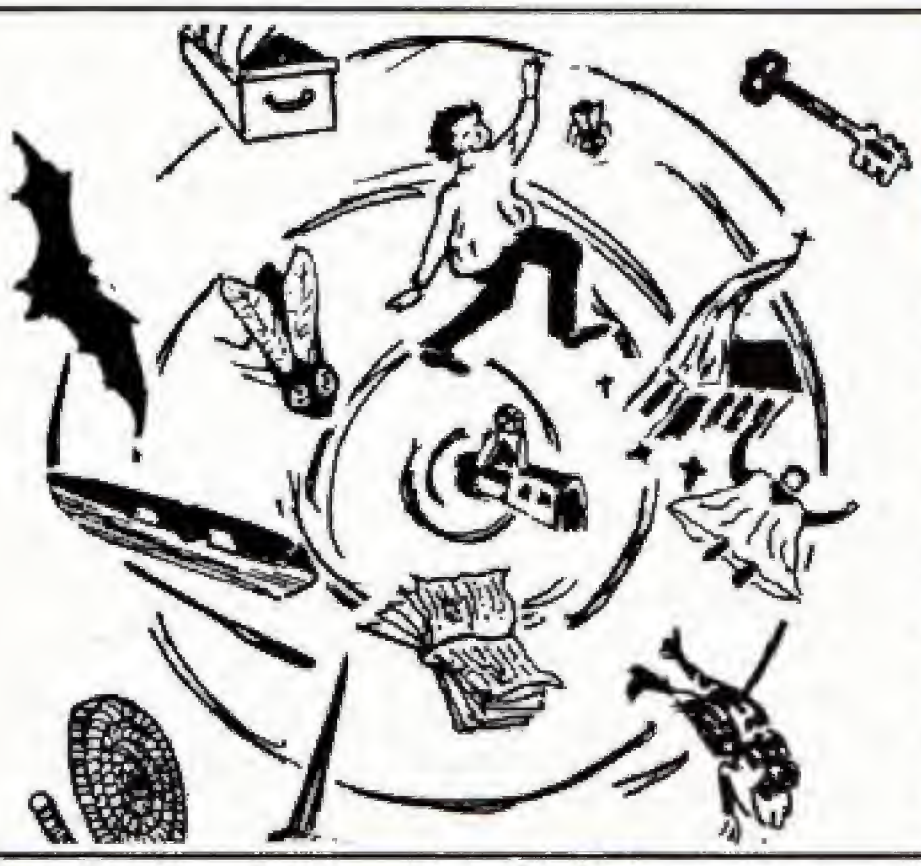

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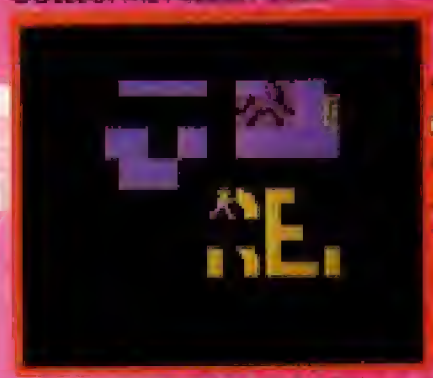

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